NAVSHIPS 92839 (Non-Registered)

TECHNICAL MANUAL

for

ANTENNA COUPLER GROUPS AN/SRA-16, AN/SRA-16A

NEMS-CLARKE, INC.
SILVER SPRING, MARYLAND

GRANITE STATE MACHINE CO., INC.
MANCHESTER, NEW HAMPSHIRE

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From: Chief, Bureau of Ships
To: All Activities concerned with the Installation, Operation, and Maintenance of the Subject Equipment

Subj: Technical Manual for Antenna Coupler Group AN/SRA-16 NAVSHIPS 92839

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A. G. MUMMA
Chief of Bureau

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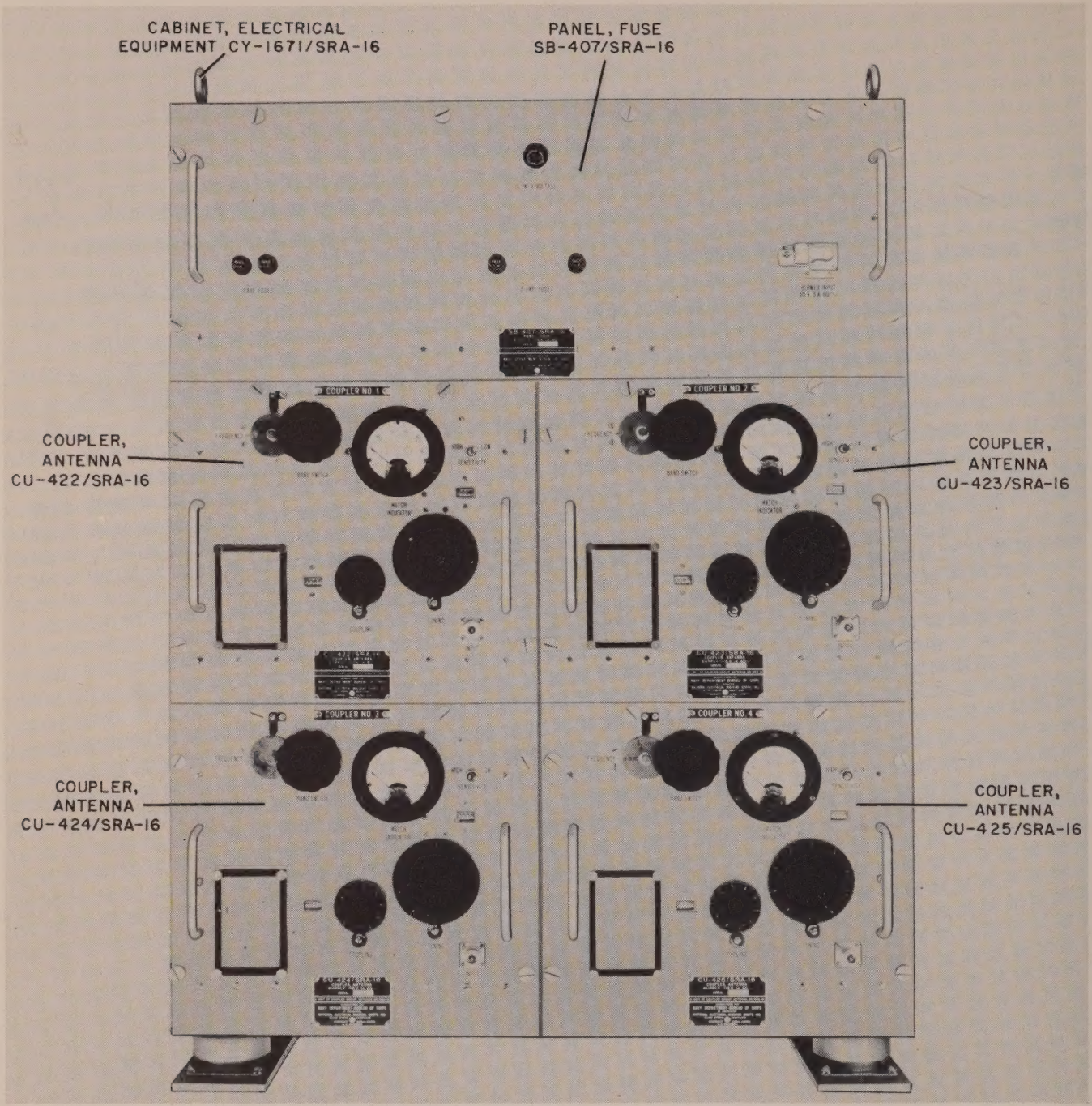


Figure 1-1. Antenna Coupler Group AN/SRA-16

SECTION 1
GENERAL DESCRIPTION

Note
Unless otherwise indicated, all references to Antenna Coupler Group AN/SRA-16 apply equally to Antenna Coupler Group AN/SRA-16A

1. INTRODUCTION.

This instruction book covers the description, theory, installation, operation and maintenance of Antenna Coupler Group AN/SRA-16. (See figure 1-1.)

2. PURPOSE.

Antenna Coupler Group AN/SRA-16 is designed specifically for shipboard use. Each coupler group is capable of coupling four transmitters into a single broadband antenna. Each coupler group must be operated independently with a broadband antenna designed to produce a voltage standing wave ratio no greater than 3 to 1 over its frequency range at the output terminal of the coupler group. The principal function of this equipment is to provide an efficient means for operating several transmitters having an output power up to 500 watts, into a single broadband antenna. For example, the use of five of these couplers, covering the desired frequency ranges, requires only 5 broadband antennas instead of 20 antennas (each for a separate frequency) with consequent space saving and minimization of radiation absorption loss.

Each transmitter operating with a coupler group must be set to operate at channels spaced at least 10 per cent from any other frequency in the group. This spacing shall be based upon the high frequency end of the band.

3. PRINCIPLES OF OPERATION.

There are four antenna couplers in each Antenna Coupler Group AN/SRA-16, designated COUPLER NO. 1, COUPLER NO. 2, COUPLER NO. 3, and COUPLER NO. 4. They consist of Couplers, Antenna CU-422/SRA-16; CU-423/SRA-16; CU-424/SRA-16; and CU-425/SRA-16, respectively. Each coupler operates over a frequency range of from 9 mc to 26 mc, in three steps, under control of a band switch which selects either the 9-12 mc range, the 12-18 mc range, or the 18-26 mc range.

The output of a specific transmitter is fed into any one of these four couplers, depending upon its cable connections, through a directional-coupler type of match indicator circuit into a tuned tank circuit, and thence to a capacitively tuned output or coupling circuit to a common antenna output connection (four couplers are operated in parallel). A three-position band switch on each coupler allows selection of the desired frequency range; three ranges are provided.

The antenna couplers match the impedance of the broadband antenna transmission line to the impedance of the transmission lines between the transmitters and the antenna couplers. Operation is based upon the principle of transferring power at a specific coupler operating frequency, (which is the transmitter frequency) into a broadband antenna system, and to prevent the flow of power into the antenna coupler at frequencies other than its operating frequency. Impedance matching is accomplished by a tunable input tank circuit, and a tunable output coupling circuit. Power from the transmitter is fed to the input tank circuit, and, when the input tank, and the output coupling circuits are properly tuned to the transmitter frequency, the antenna-line impedance matches the impedance of the r-f feeder line from the transmitter, and transmitter power is coupled into the antenna system. The current in any one antenna coupler does not effect the remaining three couplers of the antenna coupler group, provided that each of the other couplers are tuned to frequencies such that the minimum spacing between operating channels is approximately 10 per cent.

A directional-coupler device, hereafter called Match Indicator, shows, by means of a microammeter, the relative magnitude of r-f voltage being reflected back toward the transmitter from the antenna coupler when the system is not matched to the antenna transmission line.

A blower assembly provides forced ventilation to cool the four antenna couplers. The blower assembly is housed behind a fuse panel which contains two active and two spare fuses for protection of the blower assembly. This panel also contains a receptacle for connecting the blower assembly to a primary power source, and an indicator lamp which lights when the blower is in operation.

4. GENERAL DESCRIPTION AND LIST OF MAJOR UNITS.

a. GENERAL INFORMATION.—Antenna Coupler Group AN/SRA-16 consists of six major units as shown in figure 1-1. Nomenclature and pertinent data are listed in Table 1-1 covering Equipment Supplied; Table 1-2 covers Equipment Required But Not Supplied; and Table 1-3 lists Shipping Data. Reference data is listed in paragraph 5.

TABLE 1-1. EQUIPMENT SUPPLIED

Quantity Per Equipment	Name of Unit	Navy Type Designation	Over-All Dimensions			Volume	Weight
			Height	Width	Depth		
1	Coupler Group, Antenna	AN/SRA-16	39-3/4	29-1/4	25-1/8		320
1	Coupler, Antenna	CU-422/SRA-16	12-3/8	13-3/4	24-3/4		42
1	Coupler, Antenna	CU-423/SRA-16	12-3/8	13-3/4	24-3/4		42
1	Coupler, Antenna	CU-424/SRA-16	12-3/8	13-3/4	24-3/4		42
1	Coupler, Antenna	CU-425/SRA-16	12-3/8	13-3/4	24-3/4		42
1	Panel, Fuse	SB-407/SRA-16	10-7/8	27-3/4	9-7/8		13
1	Cabinet, Electrical Equipment	CY-1671/SRA-16	39-3/4	29-1/4	25-1/8	14	139
2	Instruction Book	NAVSHIPS 92839					

Unless otherwise stated, dimensions are in inches, volume is in cubic feet, and weight is in pounds.

TABLE 1-2. EQUIPMENT REQUIRED BUT NOT SUPPLIED

Quantity Per Equipment	Name of Unit	Navy Type Designation	Required Use	Required Characteristics
4	Coaxial line	RG-10/U or RG-18/U	Transmitter	Length as required
4	Coaxial line	RG-10/U	*	1—2 ft
1	Coaxial line	RG-18/U	Antenna	Length as required
4	Adapter	UG-167/U	*	Or equal
4	Connector	UG-23/U	*	Or equal
4	Connector	UG-21B/U	Transmitter	Or equal
4	Connector	UG-27A/U	*	Or equal
1	Connector	UG-154/U	Antenna	Or UG-216/U
1	Power line	As required	Blower Unit	Length as required

* Used only when item No. 1 is RG-18/U.

TABLE 1-3. SHIPPING DATA

Shipping Container No.	Contents		Dimensions			Volume	Weight
	Name	Designation	Height	Width	Depth		
1	Coupler Group, Antenna	AN/SRA-16	44	32	27	22	430

Unless otherwise stated, dimensions are in inches, volume is in cubic feet, and weight is in pounds.

b. EQUIPMENT DESCRIPTION.—Each Antenna Coupler Group AN/SRA-16 consists of a group of assemblies contained in Electrical Equipment Cabinet CY-1671/SRA-16 and mounted on three decks as follows: Fuse Panel SB-407/SRA-16 is located in the top deck; COUPLER NO. 1 is located in the middle left deck, and COUPLER NO. 2 is located on the middle right deck; COUPLER NO. 3 is located on the bottom left deck, and COUPLER NO. 4 is located on the bottom right deck (See figure 1-1). The couplers are identical as to function, size, weight, and electrical characteristics. Each of the couplers is built as a plug-in drawer assembly which differ slightly according to location of plug-in connections determined by cabinet drawer location. Tuning is accomplished by means of two variable controls which may be locked at the desired dial setting. Two mechanical counters are connected to the controls to indicate control settings. A three-position band switch provides selection of one of three tunable frequency bands, and a microammeter mounted on the front panel is the indicator for the Match Indicator circuit. Fuse Panel SB-407/SRA-16 is also built as a drawer assembly, but not of the plug-in type. It supplies primary power and blower operation indication by means of an indicator lamp.

5. REFERENCE DATA.

a. NOMENCLATURE.—Coupler Group, Antenna AN/SRA-16.

b. CONTRACT NUMBER AND DATE.—NObsr-63422, 6 January 1953.

c. CONTRACTOR.—NEMS-CLARKE, Inc., 919 Jesup-Blair Drive, Silver Spring, Maryland.

d. COGNIZANT NAVAL INSPECTOR.—Inspector of Naval Material, Silver Spring, Maryland.

e. NUMBER OF PACKAGES INVOLVED PER COMPLETE SHIPMENT.—One, not including equipment spare parts.

f. TOTAL CUBICAL CONTENTS.—See table 1-1.

g. TOTAL WEIGHT.—430 pounds packed, 320 pounds unpacked.

h. FREQUENCY RANGE.—9 to 26 megacycles.

i. TUNING BANDS.—9 to 12, 12 to 18, and 18 to 26 megacycles.

j. TYPE OF FREQUENCY CONTROL.—Manual.

k. POWER HANDLING ABILITY.—Simultaneous coupling of a maximum of 500 watts, r-f power, 100 per cent amplitude modulated, from each of four transmitters to a single antenna.

l. INPUT IMPEDANCE.—50 ohms.

m. OUTPUT IMPEDANCE.—50 ohms.

n. EFFICIENCY.—Not less than 70 percent in frequency range of 9 to 18 megacycles; not less than 65 percent in frequency range of 18 to 26 megacycles.

o. VOLTAGE ISOLATION RATIO BETWEEN ADJACENT CHANNELS.—15 to 1.

p. ELECTRICAL CHARACTERISTICS OF ANTENNA.—Broadband antenna with impedance characteristics such that VSWR does not exceed 3 to 1, related to 50 ohms, across the frequency range.

q. POWER SUPPLY FOR BLOWER UNIT.—115V, single phase, 60 cycles.

r. FOR USE WITH TRANSMITTERS.—Model TBM, TBK, TCK, AN/URT-2, 3, 4, and AN/SRT-14, 15, 16.

6. DETAILED DESCRIPTION OF MAJOR UNITS.

Detailed descriptions of the major units comprising Antenna Coupler Group AN/SRA-16 are given in the following subparagraphs:

a. COUPLER, ANTENNA CU-422/SRA-16.—Antenna Coupler CU-422/SRA-16 (figure 1-1) is one of four similar couplers used in Antenna Coupler Group AN/SRA-16. It operates over a frequency range of 9 to 26 mc, and consists of an individual plug-in drawer assembly designated as COUPLER NO. 1, located on the middle left deck of Electrical Equipment Cabinet CY-1671/SRA-16.

It has two variable tuning controls and a band-switch control mounted on the front panel. Each tuning control is geared to a four-figure mechanical counter also mounted on the front panel. The control marked TUNING varies the tank tuning capacitance of the input tank circuit, and the control marked COUPLING varies the tuning capacitance in the output coupling circuit. Dial locks are provided for locking the controls. The BAND SWITCH provides three positions for three tuning ranges of 9—12 mcs, 12—18 mcs, and 18—26 mcs.

Each antenna coupler is equipped with a directional coupler connected to a d-c microammeter, marked MATCH INDICATOR, on the front panel. The microammeter is mounted in a shielded cage and is connected to a toggle switch marked SENSITIVITY HIGH-LOW for varying meter indication for tuning purposes.

A removable frame, with a lucite window, contains a a calibration chart for tuning purposes. A suitable receptacle marked INPUT is provided for connection to the transmitter the coupler is to match to the antenna.

Each antenna coupler is held in position in the cabinet by knurled thumbscrews which can be loosened from the front of the panel. The drawer assembly is guided into the cabinet by means of drawer slides, and a guide pin is provided to guide the banana-plug connector into the antenna-line coaxial receptacle. Latch fasteners provided on each side of the antenna coupler allow the drawer to be opened to various distances before complete removal, for easy maintenance.

b. COUPLER, ANTENNA CU-423/SRA-16.—This antenna coupler is similar to Coupler CU-422/SRA-16 except that it is designated COUPLER NO. 2, is located in the right-hand compartment of the middle deck of the cabinet, and has its plug-in connections located differently.

c. COUPLER, ANTENNA CU-424/SRA-16.—This antenna coupler is also similar to Antenna Coupler CU-422/SRA-16 described in paragraph 6.*a.* above, except that it is designated as COUPLER NO. 3, is located in the lower left deck of the cabinet and has its plug-in connections located differently.

d. COUPLER, ANTENNA CU-425/SRA-16.—This antenna coupler is also similar to Antenna Coupler CU-422/SRA-16 described in paragraph 6.*a.* above, except that it is designated as COUPLER NO. 4, is located in the lower right deck of the cabinet and has its plug-in connections located differently.

e. PANEL, FUSE SB-407/SRA-16.—Fuse panel SB-407/SRA-16 is located on the top deck of the cabinet. A BLOWER INPUT receptacle is mounted on the front panel of this unit to which the primary 115 vac source is connected. There are four fuse holders on the front panel. The two active fuses are located at the bottom center of the front panel, and the two spare fuses are located at the lower left corner of the front panel. An indicator lamp marked BLOWER VOLTAGE is mounted in the center of the front panel and is illuminated when the blower is in operation. The fuse panel is also a drawer type assembly mounted on slides, but is not supplied with plug-in connections. It is also held in position in the cabinet by knurled thumbscrews which can be loosened from the front panel. Latch fasteners are provided on each side of the fuse panel to allow the drawer assembly to be opened to various distances before complete removal, requiring release of the latches before the drawer can be removed, and providing ease of servicing.

f. CABINET, ELECTRICAL EQUIPMENT CY-1671/SRA-16.—Cabinet, Electrical Equipment CY-1671/SRA-16, as shown in figure 1-1, consists of a steel cabinet with a top deck and four lower rectangular-shaped compartments, two on the lower right side and two on the lower left side. The top shelf, which houses the blower unit and air filters, is enclosed in the front by Panel, Fuse SB-407/SRA-16. The four lower compartments house the four antenna couplers. As the four couplers are not interchangeable, they must be arranged numerically in the positions indicated by figure 1-1. Extending vertically through the inside rear of cabinet is the ventilating duct which connects the blower unit in the upper deck with a blower outlet in each of the four lower compartments. Louvres are provided on both sides and rear of the cabinet for blower intake and outlet. Extending horizontally through the rear right half of the cabinet is the coaxial line from the broadband antenna. This coaxial line extends from the receptacle marked OUTPUT on the right hand side of the cabinet to the octagonal outlet box in the rear of the cabinet where connection is made to the plug-in connectors for the four couplers. Four shock mounts are provided for deck or bench mounting. Four eye bolts are provided at the top of the cabinet for insertion of lifting bars for moving the cabinet, preferably with all drawer assemblies removed. Two sway-mounts are provided at the top rear of the cabinet.

7. EQUIPMENT SIMILARITIES.

Antenna Coupler Group AN/SRA-16 is designed to work together with Antenna Coupler Group AN/SRA-13, Antenna Coupler Group AN/SRA-14, and Antenna Coupler Group AN/SRA-15. Each coupler group covers different ranges of frequencies and together will cover a total range of from 2 mc to 26 mc, handling the output of sixteen transmitters into four separate broadband antennas. Table 1-4 lists the basic similarities of the AN/SRA-Series of equipments. They may be used in any combination desired, provided they are operated, and connected as indicated in their respective Technical Manuals.

TABLE 1-4. BASIC SIMILARITIES IN AN/SRA-SERIES ANTENNA COUPLER GROUPS

Model	Frequency Range (mc)	Coupler, Antenna	Panel Fuse	Cabinet, Electrical Equipment	Power Supply	Instruction Book (Navships)
AN/SRA-13	2 — 6	CU-419/SRA-13	SB-406/SRA	CY-1670/SRA	115V, ac	92746
AN/SRA-14	4 — 12	CU-420/SRA-14	SB-406/SRA	CY-1670/SRA	115V, ac	92746
AN/SRA-15	6 — 18	CU-421/SRA-15	SB-406/SRA	CY-1670/SRA	115V, ac	92746
AN/SRA-16	9 — 26	CU-422/SRA-16 through CU-425/SRA-16	SB-407/SRA-16	CY-1671/SRA-16	115V, ac	92839

SECTION 2
THEORY OF OPERATION

1. INTRODUCTION.

a. GENERAL.—Antenna Coupler Group AN/SRA-16 consists of a cabinet (Cabinet, Electrical Equipment CY-1671/SRA-16) containing five major assemblies consisting of a fuse panel and four similar antenna couplers. This equipment will tune over a range of 9 mc to 26 mc for each coupler. Each coupler can match the 50-ohm transmission line input impedance (from each transmitter) to the impedance of a common transmission line output (to a single broadband antenna) to which all four couplers are connected in parallel. Each coupler is designed to operate on a channel, or frequency band, separated by not less than 10% of the highest frequency of the band in use, although each coupler is tunable over the entire range of frequencies. To obtain optimum efficiency of transfer of power and voltage isolation ratio between adjacent frequency bands, a band switch is provided on each coupler so that any one of three frequency bands (9 mc—12 mc, 12 mc—18 mc, and 18 mc—26 mc) may be selected. These four antenna couplers are capable of matching the outputs of four separate transmitters into a single broadband antenna, permitting operation on four separate frequencies, within the tuning range, up to 500 watts output power at 100 per cent modulation. Power transfer is accomplished with an efficiency of not less than 70 per cent between 9 mc and 18 mc, and not less than 65 per cent between 18 mc and 26 mc, with a voltage standing wave ratio not to exceed 3 to 1 across the total operating range, at a nominal impedance of 50-ohms.

Since the equipment is totally enclosed and shielded, forced air cooling is provided by a blower assembly, and through ventilating ducts to each compartment of the cabinet.

Tuning is accomplished by two variable controls provided with dials and mechanical counters for calibration and logging purposes. A microammeter type of reflectometer is provided for tuning indications. Dial locks are provided for maintaining the desired tuning once accomplished.

b. Description of Circuits.—Figure 2-1 is a functional block diagram of Antenna Coupler Group AN/SRA-16. The blower assembly and fuse panel are not shown since they do not effect the function of the coupler group. They will, however, be discussed where applicable.

(1) COUPLER NO. 1.—The four antenna couplers are similar except for location of plug-in connections, and therefore, are not directly interchangeable. Their functioning and circuitry, however, are identical in all respects, and therefore, only one coupler will be discussed in detail.

The r-f output of the transmitter connected to this coupler is fed to INPUT receptacle J1 on the front panel of the coupler through a 50-ohm coaxial transmission line cable. Receptacle J1 is connected to directional coupler DC1 in the match indicator circuit. When the transmitter r-f flows through the enlarged inner conductor of the directional coupler it induces an a-c voltage in the pickup loop, which is rectified by crystal rectifier CR1 and is indicated by d-c microammeter M1. As the r-f leaves the directional coupler it is connected by cable W2 and plug P3 to the bandswitch and input tuning control tank circuit, and through a capacitively tuning coupling control circuit to a plug-in connecter assembly which connects all four couplers to a common coaxial output line which feeds a broadband antenna, through OUTPUT receptacle J302.

(2) COUPLER NO. 2.—This coupler is one of four identical couplers used in Antenna Coupler Group AN/SRA-16, and its operation is identical to that of COUPLER NO. 1 described in subparagraph (1) above.

(3) COUPLER NO. 3.—This coupler is one of four identical couplers used in Antenna Coupler Group AN/SRA-16, and its operation is identical to that of COUPLER NO. 1 described in subparagraph (1) above.

(4) COUPLER NO. 4.—This coupler is one of four identical couplers used in Antenna Coupler Group AN/SRA-16, and its operation is identical to that of COUPLER NO. 1 described in subparagraph (1) above.

(5) CABINET, ELECTRICAL EQUIPMENT CY-1671/SRA-16.—This cabinet houses the four Antenna Couplers, Fuse Panel SB-407/SRA-16, a blower assembly, and a built in coaxial line from each of the four coupler plug-in connections to the output receptacle.

(6) BLOWER ASSEMBLY.—The blower assembly mounted on the top deck in back of the fuse panel is used to cool all antenna couplers by means of a ventilating duct which is piped into each compartment.

(7) PANEL, FUSE, SB-407/SRA-16.—This drawer assembly is located in the top deck of the cabinet which contains the blower assembly, and mounts the primary power input connections for the blower, four fuses, and a blower indicator lamp. Two of the fuses are spares only.

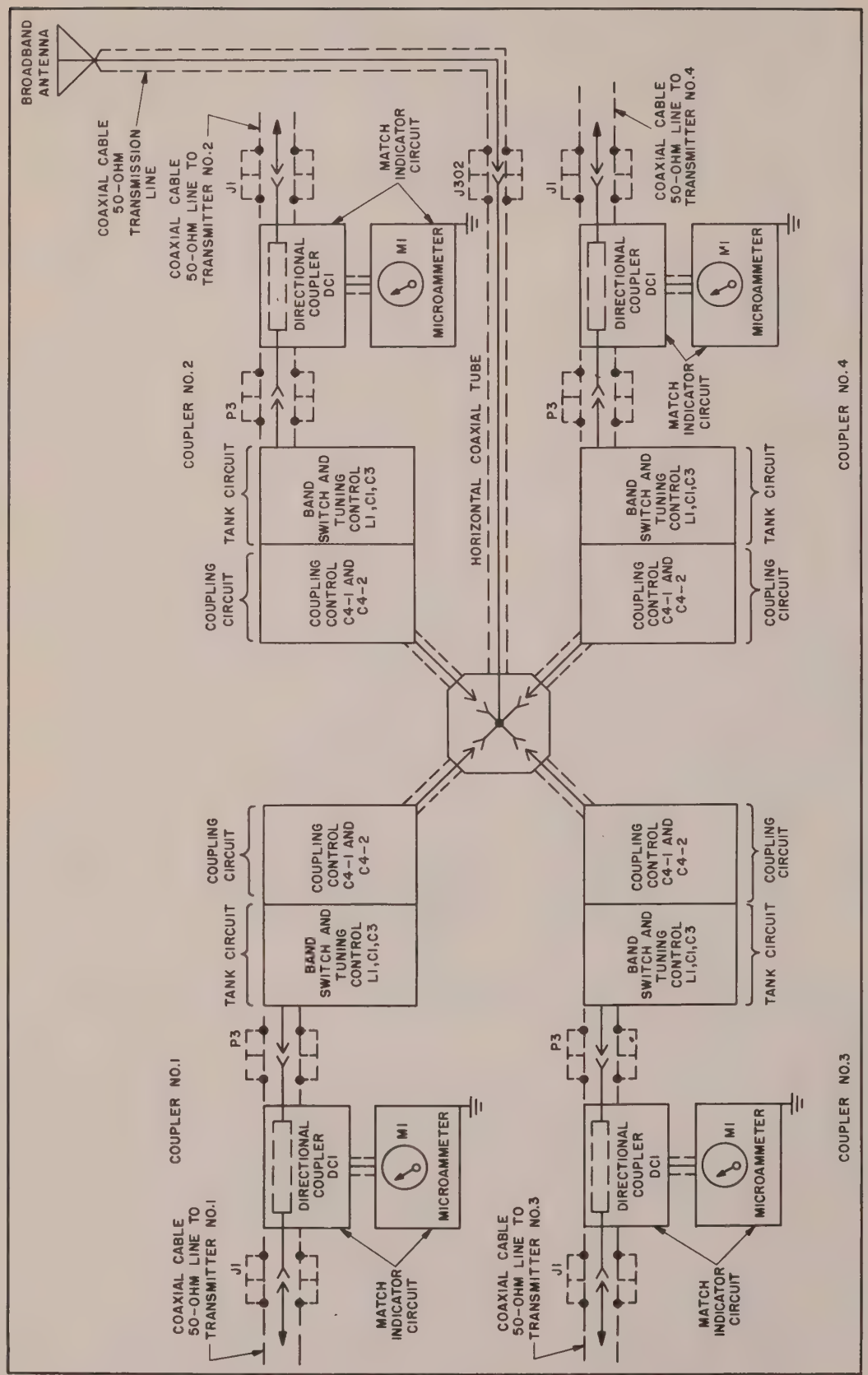


Figure 2-1. Antenna Coupler Group AN/SRA-16, Functional Block Diagram

2. CIRCUIT ANALYSIS.

a. GENERAL.—The design and operation of each of the antenna couplers is identical, therefore only one coupler will be discussed in detail. Placement of the antenna couplers within the cabinet compartments is not a factor in their operation except that because of the physical arrangement to accomplish the plug-in design, each coupler has its mating connections located differently. It is, therefore, necessary that they be located in their proper positions in the cabinet compartments namely: COUPLER NO. 1 left middle compartment, COUPLER NO. 2 right middle compartment, COUPLER NO. 3 left bottom compartment, and COUPLER NO. 4 right bottom compartment. Since these couplers all cover the same range they can be used with any transmitter, it is suggested for ease of operation they be connected to the transmitter bearing the same symbol, that is COUPLER NO. 1 with Transmitter No. 1 etc.

b. COUPLER, ANTENNA CU-422/SRA-16.—This coupler is one of four identical couplers bearing different nomenclature, used with Antenna Coupler Group AN/SRA-16. It consists of an input impedance matching and output coupling circuit, and a match indicator circuit discussed in the following paragraphs, see figure 7-10 for schematic diagram.

(1) INPUT IMPEDANCE MATCHING CIRCUIT AND OUTPUT COUPLING CIRCUIT.—The purpose of this circuit is to match the 50-ohm impedance of the transmission line from the Transmitter to the antenna impedance appearing at the output terminal of the coupler group. Power from the h-f transmitter enters through input receptacle J1 and passes through the enlarged inner conductor of directional coupler DC1 into the capacity tuned tank circuit composed of input coupling capacitor C1, tank tuning capacitor C3, and tank inductance coil L1.

Input coupling capacitor C1 is a variable air-dielectric plate meshing type, with three sections in parallel, section C1-1 being 20—200 $\mu\mu$f, section C1-2 being 20—200 $\mu\mu$f, section C1-3 being 30—800 $\mu\mu$f. Tank tuning capacitor C3 is a variable vacuum-dielectric type with a capacitance of 10—300 $\mu\mu$f. Both variable capacitors are operated in unison by one control shaft, marked TUNING, which is geared to a mechanical counter in the ratio that one full turn of the dial registers 10 units on the counter. The control is locked by the turn of a separate knob in a clockwise direction at the base of the dial. Tank inductance coil L1 is a fixed coil of 11 turns of nilvar rod, 0.187 inch diameter. The inside diameter of the coil is 2-3/4 inches.

Power is transferred from the tank circuit to the antenna transmission line through output coupling capacitor C4-1 which is a vacuum-dielectric type with a variable capacitance of 5—25 $\mu\mu$f. It is operated in unison with compensating capacitor C4-2 which is of the same type and has the same range of capacity as C4-1, but is ganged in reverse so that C4-2 decreases as C4-1 increases. The capacity between the common junction point and ground thus remains essentially constant, minimizing the reaction between the coupler units during tuning operations. Operation of the two capacitors in unison is performed by the control marked COUPLING which is geared to a mechanical counter in the same manner, and in the same ratio, as the TUNING control; it also has a similar locking device.

The reactance of output coupling capacitor C4-1 is large, so that a high voltage must be developed in the tank circuit in order to deliver power into the 50-ohm antenna transmission line. Viewing the circuit from the broadband antenna transmission line terminal, a voltage on this line meets the high reactance of output coupling capacitor C4-1 in series with the impedance of the tank circuit. If the tank circuit is off resonance for the frequency of the antenna transmission line voltage, its impedance is low compared to that of C4-1, so that only a small portion of the antenna transmission line voltage appears at the input terminal at unwanted frequencies. When tuned to the frequency of the antenna voltage, received energy is transferred to the input terminal as effectively as for transmitting. Therefore, with due regard to receiver characteristics, these couplers can be used for either transmitting or receiving.

As stated previously above, input coupling capacitor C1 and tank tuning capacitor C3 are ganged to a single control, marked TUNING, to maintain a nearly constant ratio of capacity over the frequency range of the equipment. Their capacity ratio is such that when output coupling capacitor C4-1 is properly set for a given frequency, the input coupling and tank tuning capacitors can be simultaneously adjusted by the TUNING control to resonate the tank circuit and produce a 50-ohm resistive input impedance.

Input coupling capacitor C1, is made up of three parallel sections, associated with three contact assemblies, E1, and a plunger, E2, which are arranged to disconnect certain sections of this capacitor as the frequency is increased. Likewise, a second plunger, E2, is arranged to reduce the number of effective turns in tank inductance coil L1 as the frequency is increased. Both plungers are operated in unison from the knob marked BAND SWITCH on the front panel of the coupler. This arrangement is necessary so that the required operating efficiency and voltage isolation ratio of the channels are maintained over the three bands of frequencies in the range of 9 to 26 megacycles. When the plungers are in position 1, all three sections of capacitor C1 and all inductance of coil L1 is used; when properly tuned the coupler will then operate with an efficiency of not less than 70 percent and a voltage isolation ratio of about 15 to 1 (23.5 db) over the frequency range of 9—12 megacycles. When the plungers are in position 2, sections C1-2 and C1-3 of capacitor C1 and 7 turns of inductance L1 are used; when properly tuned the same operating efficiency and voltage isolation ratio are then obtained over the frequency range of 12—18 megacycles. When the plungers are in position 3, only capacitor section C1-3 and 4 turns of inductance L1 are used; an

operating efficiency of 65 percent and a voltage isolation ratio of 15 to 1 are then obtained when the coupler is tuned over the frequency range of 18—26 megacycles.

The four couplers of this antenna coupler group are capable of presenting a 50-ohm resistive impedance to the transmitter input even though the transmission line from the broadband antenna presents a mismatch of 3 to 1 (related to the 50-ohm feed lines) to the coupler output terminal.

(2) MATCH INDICATOR CIRCUIT. — The match indicator circuit is identical in each coupler, and is a special reflectometer which is connected in series with the transmission feed line and requires no adjustment. Its function is to detect the flow of r-f energy in one direction only, and thereby indicate the relative magnitude of the r-f voltage being reflected back toward the transmitter from the coupler. When the coupler is properly tuned, it presents approximately 50 ohms resistance at its input terminal, thus matching the 50-ohm impedance of the transmission line to the transmitter. This results in zero reflected power from the coupler, causing microammeter M1, marked MATCH INDICATOR, to indicate minimum. The match indicator circuit consists of a directional coupler, DC1, and a metering circuit which are discussed in the following paragraphs.

(*a*) DIRECTIONAL COUPLER.—The directional coupler consists of a rectangular metal box which forms a portion of the transmission line outer conductor. The inner conductor of the transmission line is enlarged in diameter and insulated through the box to maintain the 50-ohm characteristic impedance of the transmission line. Energy is picked up from the magnetic field of the enlarged inner conductor by the pick-up loop, which is also inside the rectangular metal box. Proper spacing between the pick-up loop and the inner conductor and proper selection of the value of balancing resistor R2 results in a balance between the inductive and capacitive components of the energy picked up over the frequency range of the coupler. This energy is rectified by crystal detector CR1 and the resultant dc is indicated on microammeter M1. C2 is an r-f bypass capacitor.

(*b*) METER CIRCUIT.—The meter circuit consists of microammeter M1, HIGH-LOW SENSITIVITY switch S1, and limiting resistor R1, all contained in a separate metal case. The balance condition for the pick-up loop used in these match indicator circuits occurs when R2 has a value of 120 ohms. Thus, with a matched condition at a frequency of 9-megacycles, microammeter M1 reads practically zero. When operating at frequencies higher than 9 mc, a matched condition may show a small microammeter reading, since the sensitivity of the device increases with the higher frequency range. Resistor R1 and switch S1 provide for high and low sensitivity adjustments. CR1, R2, and C2 are parts of the assembly of directional coupler DC1. M1, S1, and R1 are enclosed in a separate shielded case, which is an extension of the rectangular metal box.

Since the match indicator circuit is oriented to indicate power flowing towards the transmitter, the microammeter will show a reading when power from another transmitter flows through the coupler equipment. Furthermore, since the coupler provides a match for only the frequency to hich it is tuned, harmonics or spurious frequencies in the output of the transmitter being used will be reflected and, if of any appreciable magnitude, will cause the meter to deflect.

(3) MECHANICAL TUNING SYSTEM.—The following paragraph will aid in understanding the function and linkages used to make up the mechanical tuning system.

(*a*) TUNING CONTROL.—As the TUNING control rotates, (See figures 7-5, 7-6 and 7-7) helical gear O-14 mounted on drive shaft O-9 drives vacuum capacitor C3 through coupling O-15, and simultaneously O-14 drives, through its lower gear, right angle shaft extension O-17 which, through worm gear O-21, drives variable air-capacitor C1 through spur gear O-27. The mechanical counter for the TUNING dial is driven from shaft O-9 through bevel gears O-4, O-5, and O-6.

(*b*) COUPLING CONTROL.—As the COUPLING control rotates, (See figures 7-6, and 7-7) miter gear O-51 on drive shaft O-50 rotates and drives miter gear O-52 which operates counter M2. At the same time, shaft O-50 drives spur gear O-58 which turns the two spur gears O-59 which drive vacuum capacitors C4-1 and C4-2. Worm gear O-54 is located on drive shaft O-50 between and beneath the vacuum capacitors and drives detent O-57 back and forth along the shaft, being guided by guide rod O-60 and is used to butt against gear stops O-56 on opposite ends of worm gear O-54 to fix the maximum and minimum limits of rotation of the vacuum capacitors to prevent overshoot.

(*c*) BAND SWITCH CONTROL.—As the BAND SWITCH is moved (See figure 7-7) from the 9—12 mc position to the 12—18 mc position, and finally to the 18—26 mc position, drive shaft O-31 rotates spur gear O-32 to drive spur gear O-33 mounted on the switch indicator-dial shaft O-34 to turn the band indicator dial-plate to the proper position. As shaft O-31 rotates, it also turns worm gear O-41 in the band switch gear box which drives lower worm gear O-44. Since O-44 is mounted on shaft O-43 at right angles to gear O-41, the motion from O-41 is transmitted to drive two spur gears O-45 on each end of shaft O-43. Spur gears O-45, in turn, drive rack gears O-45 on each side of the gear box causing them to move in and out, operating the shorting bar plungers E2 to vary the turns of coil L1 used in the tuning circuit, and to simultaneously select tuning capacitors C1-1, C1-2, or C1-3 as required for proper tuning, efficiency and voltage isolation. Stops are provided to prevent overshooting.

c. COUPLER, ANTENNA CU-423/SRA-16.—Coupler, Antenna CU-423/SRA-16, operating in the frequency range of 9—26 megacycles is used in Antenna

Coupler Group AN/SRA-16. It consists of a match indicator circuit, and an input impedance matching and output coupling circuit.

Operation of Antenna Coupler, CU-423/SRA-16 is identical to the operation of Antenna Coupler CU-422/SRA-16 discussed in paragraph 2.*b*.

d. COUPLER, ANTENNA CU-424/SRA-16.—Coupler, Antenna CU-424/SRA-16, operating in the frequency range of 9—26 megacycles is used in Antenna Coupler Group, AN/SRA-16. It consists of a match indicator circuit, and an input impedance matching and output coupling circuit.

Operation of Antenna Coupler CU-424/SRA-16 is identical to the operation of Antenna Coupler, CU-422/SRA-16 discussed in paragraph 2.*b*.

e. COUPLER, ANTENNA CU-425/SRA-16.—Coupler, Antenna CU-425/SRA-16 operating in the frequency range of 9—26 megacycles is used in Antenna Coupler Group, AN/SRA-16. It consists of a match indicator circuit, and an input impedance matching and output coupling circuit.

Operation of Antenna Coupler CU-425/SRA-16 is identical to the operation of Antenna Coupler CU-422/SRA-16 discussed in paragraph 2.*b*.

f. PANEL, FUSE SB-407/SRA-16.—Panel, Fuse SB-407/SRA-16 is used in Antenna Coupler Group AN/SRA-16. A 115-volt, 60 cycle, a-c power source is connected to receptacle J201. Both sides of the a-c line leading to terminals 1 and 4 of a terminal board TB301 mounted in the cabinet are fused by F201 and F202. Across the a-c line is BLOWER VOLTAGE indicator lamp I-201 which is illuminated when the blower motor is in operation.

g. CABINET, ELECTRICAL EQUIPMENT CY-1670/SRA.—Cabinet, Electrical Equipment CY-1671/SRA-16 is a steel constructed, three deck cabinet which houses the five removable units—four antenna couplers and a fuse panel, each in a separate compartment.

Located in the uppermost compartment, is a blower assembly which provides forced ventilation to cool the antenna couplers located in the remaining four compartments. The blower assembly consists of a-c motor B301, motor starting capacitor C301 and two fiberglas air-filters FL301. A terminal board is mounted on the starting capacitor to terminate the red and yellow wires extending from the fuse panel to the blower unit. These wires are equipped with spade lugs to facilitate their disconnection at the terminal board when the fuse panel drawer assembly is removed from the cabinet. A suitable ON and OFF switch must be provided at some suitable location near the cabinet for starting and stopping the blower motor.

Motor B301 is a sealed-unit, dual-voltage, 115/230V, a-c motor, operating, in conjunction with an oil-filled, paper-dielectric, 3 μf, 220V, phase-splitting blower capacitor C301, from a 115V, 60-cycle, single phase power supply. The blower is of centrifugal type with the air-flow inlet at the top right of the cabinet and the air-flow outlet connected to a vent with an air jet in each compartment in which the coupler drawer assembly is placed. The rotation of the blower is counterclockwise, 6 o'clock blast.

h. CHANNEL SEPARATION.—In order to keep interaction between adjacent channels in a specific coupler group at a practical minimum, a channel separation of at least 10 percent should be maintained. For example, if the No. 3 coupler in Antenna Coupler Group AN/SRA-16 is tuned to operate at a frequency of 12 mc, the two couplers nearest in frequency in the same coupler group should be tuned to operate at frequencies no closer than 10.8 mc and 13.2 mc. Such channel separation results in a minimum voltage-isolation ratio of about 15 to 1, or an equivalent of 23.5 db, in which event the interaction between couplers is negligible. Further information on channel separation is given in Section 4, paragraph 3.

i. CALIBRATION.—Typical calibration curves are shown in figure 3-3 for COUPLING control settings and figure 3-4 for TUNING control settings. These calibration curves show typical control settings for a frequency range of 9—26 megacycles and an antenna system impedance of 50 ohms $\pm$ J_0. Each coupler unit should be adjusted under actual operation conditions at time of installation, as described in Section 3, paragraph 5.

SECTION 3
INSTALLATION

1. UNPACKING.

Each coupler group is packed in one container consisting of a wooden box bolted to a platform mounted on skids. To unpack the equipment remove the nails around the top of the box with a nail puller and remove the top of the box. Remove the four bolts through the shock mounts and box sides, and remove the box sides. Remove the four bolts holding the equipment to the platform. Using a hoist, or by inserting lifting bars through the eyebolts at the top of the cabinet, place the equipment in the desired location. Remove all padding from the equipment and clean away all dust and dirt. This includes the inside of the drawer assemblies. Release the knurled panel screws, withdraw each of the drawers to the stop and inspect the equipment for any damage which may have occurred in shipment. Report any damage and make repairs before installation.

2. INSTALLATION.

a. GENERAL.—The coupler group is designed for mounting in an upright position on a bench or on the deck. Bench mounting is considered preferrable both for ease in mounting and for bringing the control knobs, counters, and other instruments to a more convenient operating level. The coupler group should be located in the radio transmitter room, near the transmitters to which it is to be connected.

b. LOCATION.—See figure 3-1 for an outline and mounting dimension drawing of Cabinet, Electrical Equipment CY-1671/SRA-16.

Approximately 15 inches clearance must be provided at the right side of the cabinet for ventilation and for access to the antenna transmission line receptacle. A minimum of three inches clearance should be provided on the left side of the cabinet for ventilation.

A bracket or plate must be installed on the bulkhead, or other support, for securing the upper rear sway mounts. The equipment is secured to the deck or bench by means of two plates to which four shock mounts are attached, at the bottom of the cabinet. Hexagonal head bolts or cap screws, 3/8-16, should be used for securing the cabinet mounting plates to the bench, or deck, and to the bulkhead. A total of 8 bolts, 1-1/2 inches long with nuts and lockwashers are required. Make certain that the cabinet is in a level position to insure smooth-working control shafts.

(1) ANTENNA COUPLERS.—Ascertain that the antenna coupler drawers are inserted in the cabinet in the proper order as shown in figure 3-1, that is COUPLERS NO. 1, 2, 3 and 4 in their proper locations. Release the panel thumb screws and withdraw the drawers to the stop. Check to see that the short coaxial cables between directional coupler DC1 and the input connector, and between the coupler and the input tank circuit are properly connected. Operate the controls and observe if the variable tank capacitors and output coupling and matching capacitors change position. Push the drawers in the cabinet and tighten the knurled panel thumbscrews securing the front panel.

(2) PANEL, FUSE SB-407/SRA-16.—Release the four knurled panel screws in the fuse panel and withdraw the panel to the stop. Note if the two leads to the blower voltage indicator lamp are connected to the terminal board near the blower motor. If not, connect the two spade terminated lugs from the lamp to terminals 1 and 4 of TB301, see figure 3-2.

3. INSTALLATION OF CABLES.

a. GENERAL.—Figure 3-2 illustrates the cable assemblies connected to a coupler group. There are no critical lengths of coaxial transmission line; however, it is always good practice to keep these lines as short as possible.

b. CARE OF CABLES.—Run the cable assemblies so that they will be protected from damage; avoid depressing them against sharp edges and never subject coaxial cables to excessive pressure or bends. Each cable should be mechanically supported at frequent intervals throughout its entire length.

c. TRANSMISSION LINE (INPUT) CABLE ASSEMBLY.—When the transmitter output cable (item 1 of figure 3-2) is type RG-10/U coaxial line, connect its terminating plug to angle adapter UG-27A/U. Connect the angle adapter to the INPUT receptacle of the antenna coupler.

When the output cable of the transmitter is type RG-18/U coaxial line, a special cable assembly must be constructed. Cut a 2-foot length of type RG-10/U coaxial line. Terminate one end in a type UG-941A/U connector and terminate the other end in a type UG-940A/U receptacle. Assemble a type UG-982/U adapter on the type RG-18/U antenna line. The UG-940A/U receptacle and the UG-982/U will then mate. Connect the UG-941A/U fitting to a UG-24A/U transmitter output cable right-angle adapter and connect this to the antenna coupler input receptacle.

d. TRANSMISSION LINE (OUTPUT) CABLE ASSEMBLY.—Terminate the end of the type RG-18/U

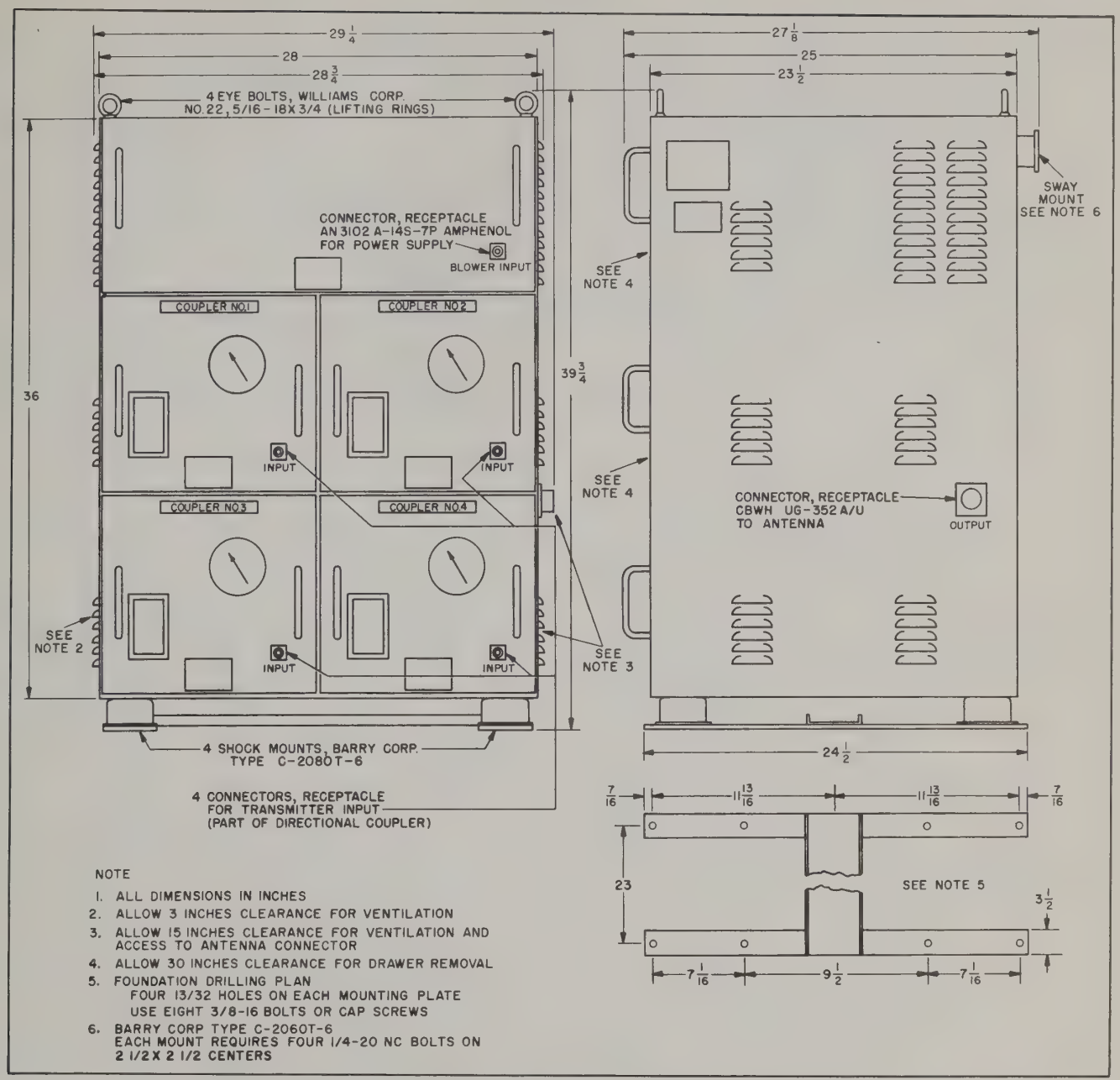


Figure 3-1. Antenna Coupler Group AN/SRA-16, Outline and Mounting Dimensions

antenna transmission line with a type UG-54/U cable connector. Connect to this a UG-216/U right-angle adapter. This fitting will then mate with output receptacle J302, a UG-352A/U fitting, located on the lower right side of the cabinet.

e. POWER SUPPLY CABLE ASSEMBLY.—Terminate one end of a suitable length of three conductor cable type TCOP-3 with the AN3018B-14S-7S Amphenol 90-degree angle connector, P201. Tighten cable clamp E201. Connect P201 to the BLOWER INPUT receptacle J201 on the fuse panel. Connect the other end of this cable to a 115-volt, 60-cycle, single-phase, a-c power supply, controlled by a separate ON-OFF switch.

f. GROUNDING STRAP. — Ground Electrical Equipment Cabinet CY-1671/SRA-16 to the deck or bench, using a flexible copper grounding strap.

4. POWER DISTRIBUTION.

The power distribution in an antenna coupler group is restricted to the fuse panel and blower assembly (figure 7-9)

5. INITIAL ADJUSTMENTS.

a. GENERAL.—The following adjustments are made after the equipment is completely installed. It is assumed that the equipment has been properly connected. If

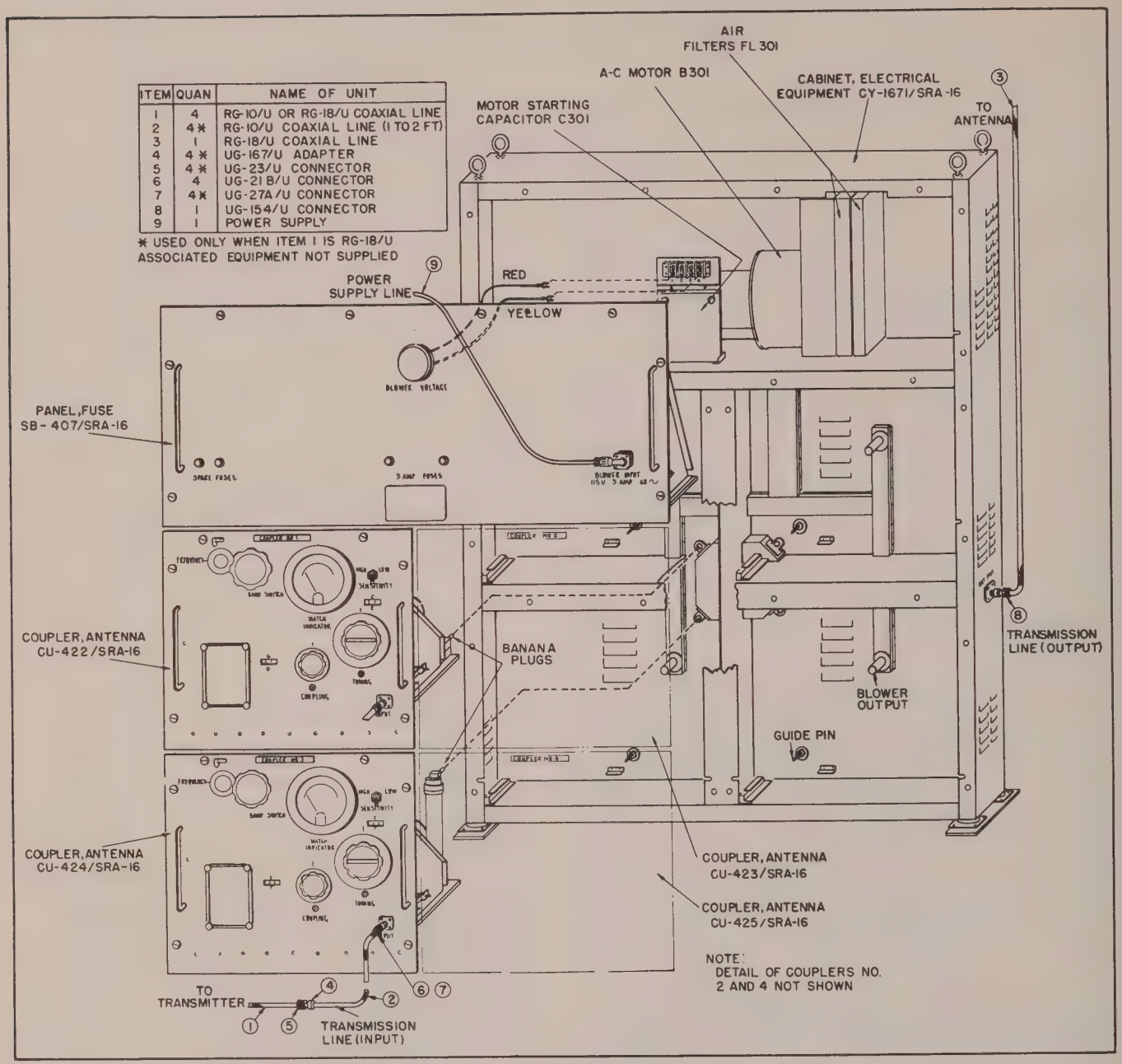


Figure 3-2. Installation Details

difficulty is experienced in obtaining the results specified in these procedures, refer to the adjustments and corrective procedures included in the maintenance section, Section 7.

b. MECHANICAL INSPECTION.—After completing the installation of the coupler group, make a thorough inspection of the equipment and its associated wiring.

c. PRELIMINARY ADJUSTMENTS.—Perform preliminary adjustments as follows:

(1) TRANSMITTER. (See par. 4-3 for frequency allocations of various transmitters)

(a) Turn transmitter off.

(b) Disconnect the transmitter output cable from the associated antenna coupler.

(c) Connect to this cable a 50-ohm, nonradiating, resistive load (Electrical Dummy Load DA-91/U) which is capable of dissipating the full output power of the transmitter (at least 500 watts).

(d) Start the transmitter and tune to the assigned frequency in the normal manner as described in the transmitter instruction manual.

(e) Turn the transmitter off.

(f) Transfer the 50-ohm resistive load in turn to each of the other transmitter output receptacles as in

step (*b*) above and repeat steps (*a*) through (*e*) above.

(*g*) Reconnect the output cable from each transmitter to its associated antenna coupler.

(2) ANTENNA COUPLERS.—Adjust the antenna couplers as follows:

(*a*) Turn all the transmitters off.

(*b*) Disconnect the antenna transmission line from the OUTPUT jack located on the right side of the cabinet.

(*c*) Connect the 50-ohm resistive load to the OUTPUT jack. This will require fabrication of a test cable as follows: To one end of a short length (about 6 feet) of RG-17/U cable attach a UG-982/U connector. To the other end of this cable attach a UG-154/U connector. Connect this fitting to the OUTPUT jack and connect the UG-982/U fitting to the DA-91/U Dummy Load.

(*d*) Adjust the TUNING control on each antenna coupler so that the associated mechanical counter is set in accordance with the typical calibration curves shown in figure 3-3 for the desired operating frequency.

(*e*) Adjust the COUPLING control on each antenna coupler so that the associated mechanical counter is set in accordance with the settings indicated in figure 3-4 for the desired operating frequency. Place the bandswitch on the correct band position for the frequency used.

(*f*) Set the SENSITIVITY HIGH-LOW switch to LOW.

(*g*) Apply power to the blower assembly.

CAUTION

BLOWER VOLTAGE indicator lamp I-202 should light and the blower should operate, otherwise excessive heat may damage the antenna coupler.

(*h*) Energize the transmitter connected to COUPLER NO. 4, and close the transmitter test key.

(*i*) Adjust the TUNING and COUPLING controls for minimum indication on the MATCH INDICATOR.

(*j*) Set SENSITIVITY HIGH-LOW switch to HIGH and readjust TUNING and COUPLING controls for minimum indication on the MATCH INDICATOR.

(*k*) Open the test key and turn the transmitter off.

(*l*) Repeat steps (*d*) through (*k*) for the remaining antenna couplers.

(*m*) Remove the 50-ohm Dummy Load from the OUTPUT jack and reconnect the antenna transmission line.

(*n*) Energize one transmitter and close the test key.

(*o*) The MATCH INDICATOR should indicate approximately zero. If it does not, the TUNING and COUPLING controls should be readjusted slightly until a minimum indication is obtained.

(*p*) Open the test key, and turn this transmitter off.

(*q*) Repeat steps (*n*) through (*p*) for the remaining antenna couplers.

(*r*) When each antenna coupler is finally adjusted, note the settings of the TUNING and COUPLING controls and record them on the calibration chart on the front panel of each antenna coupler.

(3) PERFORMANCE.—To determine the efficiency of the Antenna Coupler Group, proceed as follows:

(*a*) Turn all transmitters off.

(*b*) Disconnect one transmitter output cable from the associated coupler.

(*c*) Connect to this cable an adapter tee US-107B/U. Connect Dummy Load DA-91/U to the adapter tee.

(*d*) Start the transmitter and tune to the assigned frequency.

(*e*) Reduce the power of the Transmitter to less than 400 watts by means of the power output control on the transmitter.

(*f*) Turn off the transmitter.

(*g*) Connect an AN/USM-34/U Multimeter to the tee adapter. This will require the fabrication of a test cable as follows. To one end of a short length (about 6 inches) of RG-8/U cable attach a UG-21D/U connector. Connect one end of the cable to the adapter tee and the other end to the AN/USM-34/U Multimeter R.F. Test probe.

(*h*) Turn on the transmitter and record the reading on the voltmeter.

(*i*) Turn off the transmitter and connect the transmitter output cable to the associated antenna coupler.

(*j*) Connect the DA-91/U Dummy Load and the AN/USM-34/U Multimeter to the output jack of the AN/SRA-16 by means of the cable and connect assembly referred to in paragraph 5.*c*.(2) (*c*).

(*k*) Turn on the transmitter, and the blower in the AN/SRA-16. Tune the antenna coupler until the meter on the match indicator reads a minimum.

(*l*) Observe the reading on the AN/USM-34/U. This reading should be at least 80 per cent of the reading recorded in step (*h*) above.

(*m*) Repeat steps (*a*) through (*l*) above for the three remaining antenna couplers.

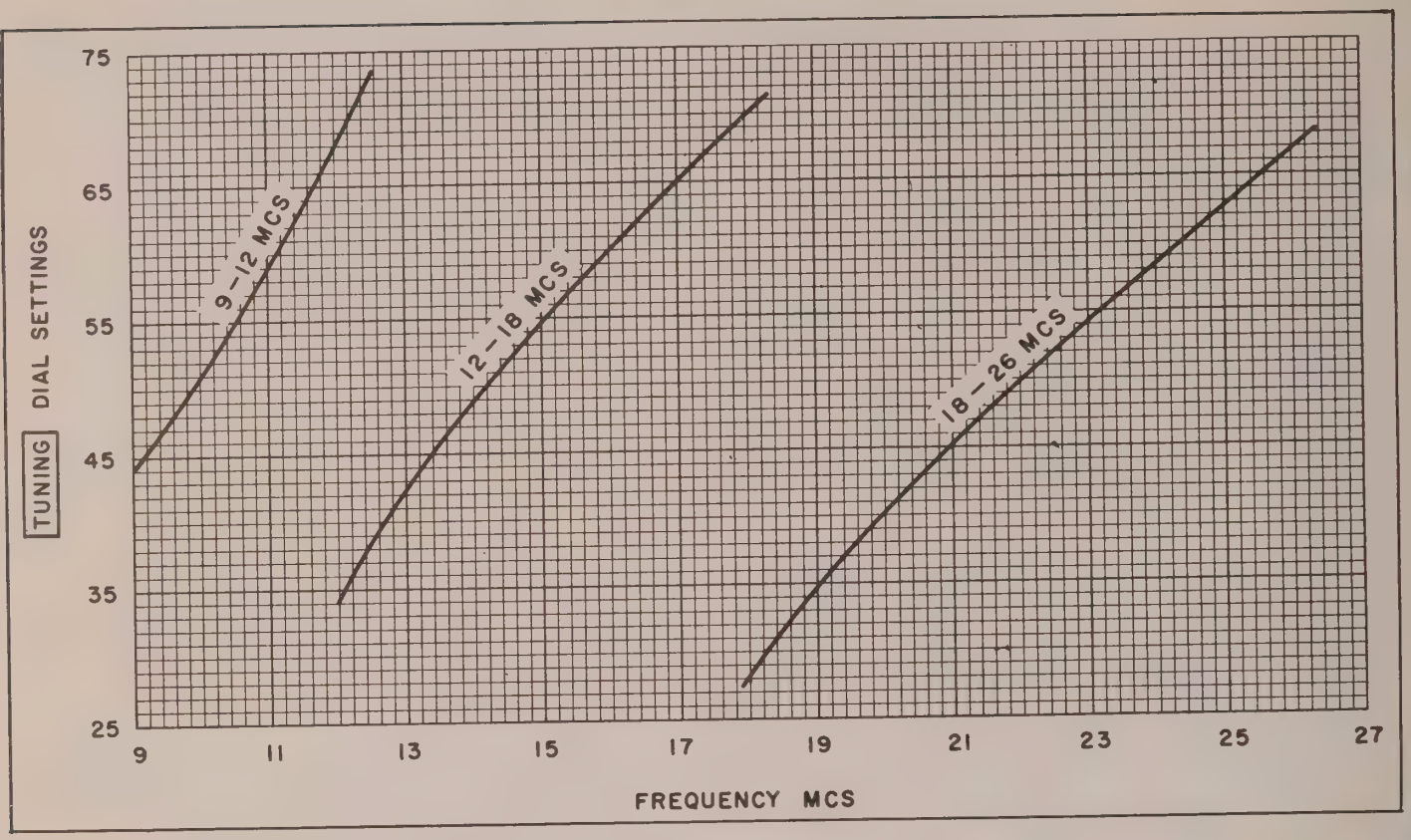


Figure 3-3. Antenna Coupler Group AN/SRA-16; Typical TUNING Dial Settings

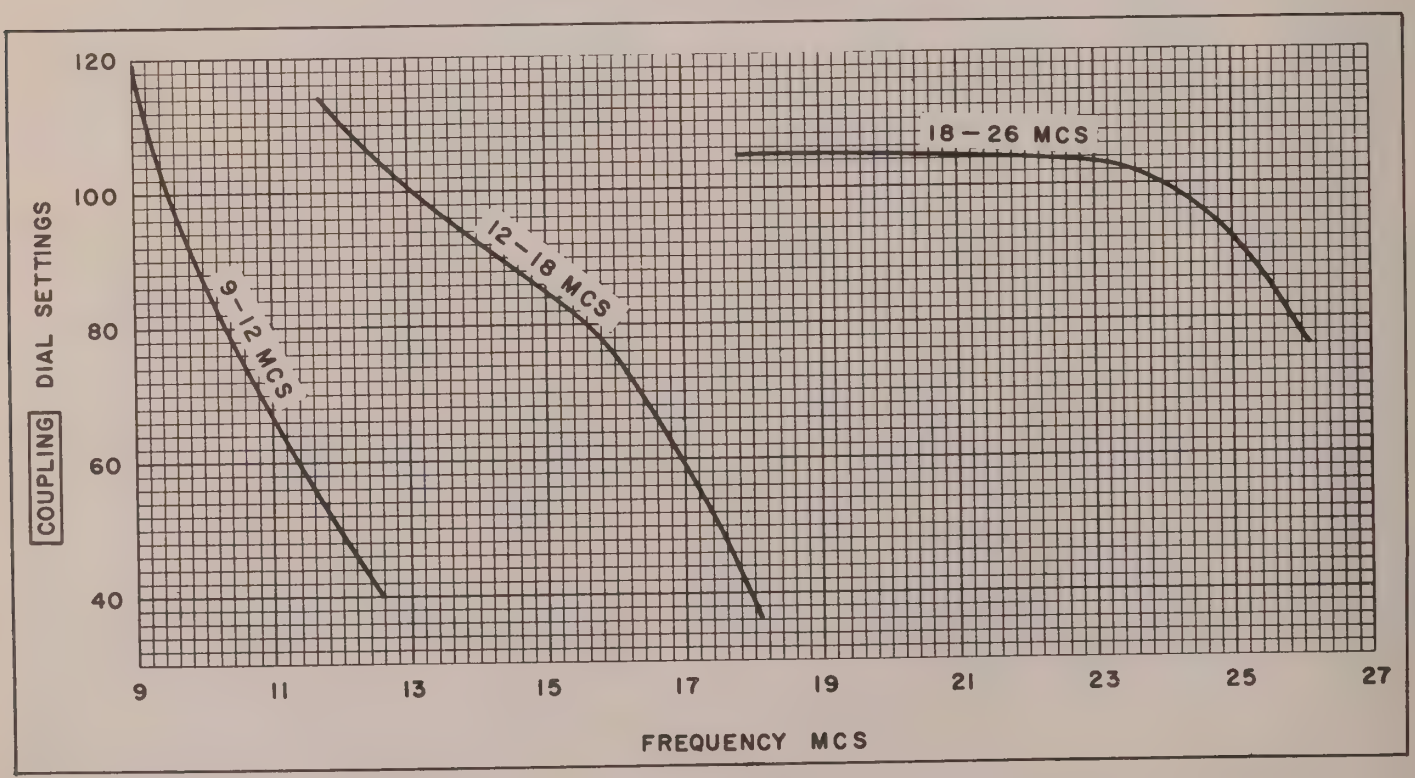


Figure 3-4. Antenna Coupler Group AN/SRA-16; Typical COUPLING Dial Settings

SECTION 4
OPERATION

1. INTRODUCTION.

a. GENERAL.—Antenna Coupler Group AN/SRA-16 is designed to permit the operation of four r-f transmitters from a single broadband antenna. Further, it can be operated independently, or in combination with any or all of Antenna Coupler Groups AN/SRA-13, AN/SRA-14, or AN/SRA-15 (see instruction book, NAVSHIPS 92746), each of which is, likewise, capable of operating four transmitters from a single broadband antenna. Due to these interrelations, the method of allocating frequencies, as described in this section, can be used, where applicable, for any of the aforenamed coupler groups when used independently, or in combination with other groups.

b. OPERATING CONTROLS AND INDICATORS.—All operating controls and indicators to be used by operating personnel are located on the front panels of the equipment. No internal adjustments or settings should be attempted by the operator. The various front-panel controls and indicators are listed in Table 4-1 and are shown in figure 4-1.

TABLE 4-1. CONTROL LOCATION AND FUNCTION

Functional Designation	Location	Letter Designation	Type of Control	Purpose of Control
BLOWER VOLTAGE	Panel, Fuse SB-407/SRA-16	1	Indicator lamp	Lights when blower motor is operating.
TUNING	Coupler, Antenna CU-422/SRA-16	2	Knob	Tunes couplers to desired operating frequency.
	Coupler, Antenna CU-423/SRA-16	2	Knob	
	Coupler, Antenna CU-424/SRA-16	2	Knob	
	Coupler, Antenna CU-425/SRA-16	2	Knob	
BAND SWITCH	All antenna couplers	3	Knob	Selects frequency band in use.
FREQUENCY	All antenna couplers	4	Dial	Indicates frequency band in use.
COUPLING	All antenna couplers	5	Knob	Adjusts coupling to antenna transmission line.
MATCH INDICATOR	All antenna couplers	6	Meter	Indicates optimum coupling.
SENSITIVITY HIGH-LOW	All antenna couplers	9	Toggle switch	Adjusts MATCH INDICATOR sensitivity.
Dial lock	All antenna couplers	7	Knob	Locks either TUNING or COUPLING controls.
Mechanical counter	All antenna couplers	8	Mechanical counter	Indicates the setting of the TUNING and COUPLING controls.

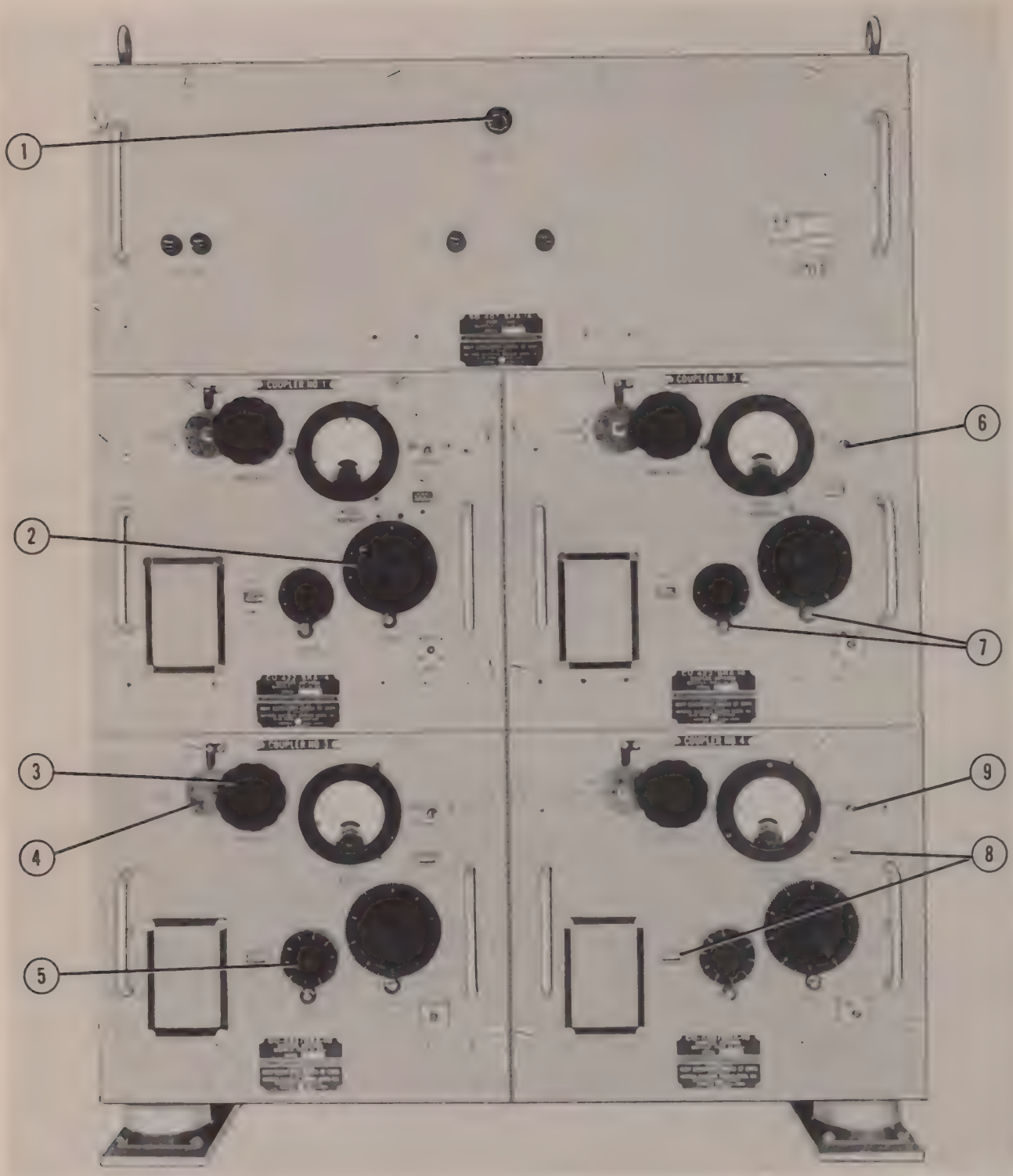


Figure 4-1. Location of Controls

(1) PANEL, FUSE SB-407/SRA-16.—The fuse panel contains a jeweled indicator lamp on the front panel, marked BLOWER VOLTAGE. When primary power is applied to the blower motor, the indicator lamp lights.

(2) ANTENNA COUPLER.—The following controls and indicators are located on the front panel of each antenna coupler.

(*a*) TUNING.—This is a knob type control which gang tunes a variable air-dielectric capacitor and a vacuum-type capacitor. It tunes the input impedance matching circuit to match the 50-ohm impedance of the transmission line from the transmitter.

(*b*) COUPLING.—This is a knob type control which adjusts the coupling between the tank impedance matching circuit and the antenna transmission line.

(*c*) BAND SWITCH.—This is a knob type control which operates the band switch to select the desired frequency band, either 9—12 mc, 12—18 mc, or 18—26 mc.

(*d*) FREQUENCY.—This is a dial indicator which indicates which frequency band is selected for use.

(*e*) MATCH INDICATOR.—This is a microammeter which indicates the degree of mismatch between the antenna transmission line and the r-f feed line from the transmitter.

(*f*) SENSITIVITY HIGH-LOW.—This is a two-position toggle switch which selects either high or low sensitivity range for the MATCH INDICATOR.

(*g*) DIAL LOCK.—Two knob type lock-controls are located directly under the TUNING and COUPLING controls. Turning the dial-lock knob clockwise locks the associated control, and turning the knob counterclockwise unlocks the associated control.

(*h*) MECHANICAL COUNTER. — Mechanical counters indicate the setting of the TUNING control and the setting of the COUPLING control.

2. OPERATING PROCEDURE.

a. PRELIMINARY.—Before energizing the equipment, proceed as follows:

(1) Check all cable connections.

(2) Check to see that the coupler groups are set to the correct operating frequency.

b. STARTING.—Proceed as follows:

(1) Apply primary power to the coupler group to be operated.

CAUTION

If the BLOWER VOLTAGE indicator lamp does not light and the blower motor does not operate check the power connector for tightness, or check the panel fuses for continuity. If lamp still does not light remove primary power and report this condition to the proper authority.

(2) Set the associated transmitters in operation as described in their instruction manuals.

(3) Check to see that the MATCH INDICATOR on each coupler indicates a minimum value. If necessary, readjust the TUNING and COUPLING controls slightly. Set SENSITIVITY control to LOW position first, and then to HIGH position for final indication.

c. STOPPING.—Proceed as follows:

(1) Stop the transmitters by pressing the stop button on their front panel.

(2) Remove primary power from the coupler group to be taken out of service.

3. FREQUENCY ALLOCATION.

Two suggested plans for frequency allocation are discussed in the following paragraphs. The equipment should be operated only on authorized frequencies within these band allocations.

a. FREQUENCY ALLOCATION FOR ONE COUPLER GROUP.—The following frequency allocation plan may be used when operating one coupler group. To obtain optimum efficiency in transfer of power from the antenna coupler to the antenna and to retain the proper voltage isolation ratio between adjacent bands, maintain a minimum channel separation of 10 per cent. Table 4-2 lists the frequency bands allocated to the four antenna couplers in the coupler group.

TABLE 4-2. TYPICAL FREQUENCY BANDS ALLOCATED FOR ONE COUPLER GROUP

Coupler No.	Coupler Group, Antenna AN/SRA-16 Band No. 1 (9 — 12 mc)	Coupler Group, Antenna AN/SRA-16 Band No. 2 (12 — 18 mc)	Coupler Group, Antenna AN/SRA-16 Band No. 3 (18 — 26 mc)
1	9.0 to 11.1 mc		
2		12.2 to 14.5	
3		16.0 to 18.0	
4			20.0 to 26.0

The high end of the band of any one antenna coupler is separated by 10 percent from the low end of the next higher frequency band. This 10 percent frequency separation allows each antenna coupler considerable flexibility for shifting frequencies within its own frequency band without interferring with an adjacent channel. Any unused frequencies between bands can be used, as long as the frequency separation between adjacent channels is not less than 10 percent.

b. FREQUENCY ALLOCATION FOR MORE THAN ONE COUPLER GROUP.—The following frequency allocation plan may be used when two or more coupler groups are operating simultaneously, and it is desired to cover a specified frequency range. This plan allows a limited frequency variation between transmitters and utilizes the overlapping frequency ranges of the coupler groups. It is possible to assign channels to an antenna coupler of one coupler group such that the spacing is only 2 percent from a channel allocated to an antenna coupler of a different coupler group. There is a 10 percent separation in frequency between COUPLER NO. 1 and COUPLER NO. 2, COUPLER NO. 2 and COUPLER NO. 3, COUPLER NO. 3 and COUPLER NO. 4. In this manner, as listed in table 4-3, 18 frequency bands may be allocated between 9 and 26 megacycles, using two identical coupler groups, and two separate antennas.

The final plan for allocation of frequencies in a specific installation must be based upon actual conditions peculiar to the installation and upon actual operation of the equipment.

4. CHANGING FREQUENCY.

The frequency allocations indicated in paragraph 3 above are sufficiently separated to permit the transmitters to operate into a coupler group without inter-channel interference. Caution must be exercised when shifting frequencies within a system because a condition where two antenna couplers are tuned momentarily to the same frequency will cause overloading of the power-amplifier tubes in the transmitters. If overloading of the transmitter did not occur, the antenna coupler being tuned would absorb a considerable portion of the energy from the operating transmitter, causing a momentary decrease in the strength of the transmitted signal. Caution must be exercised if it is proposed to operate both receivers and transmitters on the same coupler group. In such a case, it would be advisable to use a device which would disconnect the receiver from the coupler group when shifting the frequency of the receiver and its associated antenna coupler across or near the frequency in use by a transmitter.

TABLE 4-3. TYPICAL FREQUENCY BANDS ALLOCATED BETWEEN 4 AND 13 MEGACYCLES

	Coupler No.	Coupler Group, Antenna AN/SRA-16 Band No. 1 (9 — 12 mc)	Coupler Group, Antenna AN/SRA-16 Band No. 2 (12 — 18 mc)	Coupler Group, Antenna AN/SRA-16 Band No. 3 (18 — 26 mc)
GROUP 1	1	9.0 to 9.6 mc	12.2 to 12.8 mc	
	2	10.5 to 11.1 mc	14.1 to 14.5 mc	20.0 to 20.6 mc
	3		16.0 to 16.6 mc	22.7 to 23.3 mc
	4		17.6 to 18.0 mc	25.6 to 26.0 mc
GROUP 2	1	9.2 to 9.8 mc	12.4 to 13.0 mc	
	2	10.7 to 11.3 mc	14.3 to 14.7 mc	20.2 to 20.8 mc
	3		16.2 to 16.8 mc	22.9 to 23.5 mc
	4		17.8 to 18.0 mc	25.8 to 26.0 mc

SECTION 5
OPERATOR'S MAINTENANCE

1. INTRODUCTION.

To maintain peak performance of the equipment it will be necessary for the operator to perform routine checks when coming on watch and during each period that he is responsible for the operation of the equipment. Minor defects may develop during operation which may be easily rectified by the operator. Correction of these minor troubles will prevent the occurrence of major troubles at a later date. The operator should be sufficiently familiar with the technical details of the equipment to correct minor defects that may develop when trained technical aid is not available.

2. OPERATOR'S CHECK CHART.

The following check chart and service information is offered for the guidance of the operator.

TABLE 5-1. OPERATOR'S CHECK CHART—EACH WATCH, OR HOURLY

What to Check	How to Check	Precautions
Information from previous operator.	Review history in log-book. Receive verbal instructions.	Verify reported abnormal operation during your watch.
Antenna coupler tuning.	Observe meter indication. Make minor adjustments of tuning controls to verify proper tuning.	Be familiar with tuning procedure.
Operating frequency of transmitter.	Use frequency meter or other stable frequency monitoring device.	Frequencies must not drift.
Indicator lamp.	Observe indicator lamp.	Unlit indicator lamp may be indicative of inoperative blower motor.

3. REPLACEMENT OF FUSES.

The front of Fuse Panel SB-407/SRA-16 contains the four fuses for each coupler group. Two fuses are active and two fuses are spares. Table 5-2 lists the symptoms of fuse failure and other data relating to fuses.

TABLE 5-2. FUSES

Symptom	Fuse	Location	Protects	Amps	Volts
Indicator lamp I-201 does not light.	F201 F202	Panel, Fuse SB-407/SRA-16	Blower circuit Blower circuit	3 3	250 250

SECTION 6
PREVENTIVE MAINTENANCE

1. INTRODUCTION.

The maintenance of these coupler groups does not begin when the equipment fails to operate in a normal manner. Maintenance must begin weeks, even months before, when the equipment is first installed. Regular care and inspection, known as preventive maintenance, are just as important as corrective maintenance. Hence, if a regular schedule of preventive maintenance is adhered to, most of the common faults and breakdowns will never occur. Only a few minutes each day are needed to assure that the equipment is kept free from dirt, dust, corrosion and other foreign matter; that all cables and plugs of the equipment are clean and tight-fitting; and that no part of the equipment is being abused or neglected.

It is extremely important that personnel become very familiar with normal operating conditions so that abnormal conditions can be quickly detected. The equipment should be carefully studied during operation to locate all detectable symptoms of trouble. Valuable time can be saved by a careful analysis of the situation and formulation of several possible theories about the trouble. This approach is preferable to waiting for the trouble to become so serious that it causes a shut-down, even though the source of the difficulty may be, by then, quite obvious.

2. MAINTENANCE SCHEDULE.

An outline of the important items to be inspected is given in table 6-1.

TABLE 6-1. MAINTENANCE SCHEDULE

	What to Check	How to Check	Precautions and Remedies
Hourly	Antenna coupler tuning.	Observe meter indication. Make minor adjustments of tuning controls to verify proper tuning.	Be familiar with tuning procedure.
	Indicator lamp.	Observe indicator lamp.	Unlit indicator lamp may be indicative of inoperative blower motor, open fuse, or faulty indicator lamp.
Daily	Coils, capacitors, etc.	Visually and manually inspect all parts in antenna coupler for overheating and damage.	Remedy any signs of breakdown, overheating, or breakage, by repairing, or replacing part.
	Zero-setting of microammeter.	With antenna coupler not operating, meter should indicate zero.	Erroneous readings will result if meter is not zeroed. Small setscrew below glass allows adjustment.
	Accumulation of dust or dirt, and corrosion.	Note deposits of dust, dirt, or corrosion in various units.	Remove by approved methods.
	Blower motor.	Feel motor for overheating.	Check operation of blower motor.
Weekly	Connectors, receptacles, etc.	Check connectors, receptacles, and cables for looseness, wear and damage.	Tighten connector and repair cables when necessary.
	Air filters.	Inspect each filter for excessive accumulation of dust or dirt.	Clean or replace as necessary.

TABLE 6-1. MAINTENANCE SCHEDULE—Continued

	What to Check	How to Check	Precautions and Remedies
Monthly	Tuning shafts and gears.	Rotate each control to maximum and minimum settings, and note any binding, looseness, or other abnormal conditions.	Apply lubricant when necessary. Refer to lubrication instructions, paragraph 4.
	All nut, bolt, and connection screws.	Carefully check for corrosion, looseness, or poor contacts.	Use crocus cloth or #0000 sandpaper for cleaning.
Annually	Coupler group overhaul.	Thoroughly clean all components avoiding disassembly wherever possible. Relubricate gears. Replace parts where necessary.	Experienced technician should be present for any reassembly of replaceable parts.

3. REMOVAL AND REPLACEMENT.

The removal and replacement procedure for antenna couplers and fuse panel is as follows.

a. ANTENNA COUPLERS.—All antenna couplers are removed in the same manner.

(1) REMOVAL.—Proceed as follows:

(*a*) Loosen the six captive thumbscrews on the front panel.

(*b*) Pull out the drawer assembly until it is stopped by the latch fastener. (The two latches are staggered to permit the drawer to be opened to various distances. The latch on the right allows the drawer to be opened approximately 1/3. The latch on the left allows the drawer to be opened about 2/3.)

(*c*) Lift the latch fasteners and pull out the drawer assembly.

(2) REPLACEMENT.—Proceed in the reverse order of removal.

b. PANEL, FUSE SB-407/SRA-16.—All fuse panels are removed in the same manner.

(1) REMOVAL.—Proceed as follows:

(*a*) Remove the primary power.

(*b*) Loosen the six captive thumbscrews on the front panel.

(*c*) Pull out the drawer assembly until it is stopped by the latch fastener.

(*d*) Disconnect the red and yellow wires connected from terminals 1 and 4 of terminal board TB301 at the fuse panel.

(*e*) Lift the latch fasteners and pull out the drawer assembly.

(2) REPLACEMENT.—Proceed in the reverse order of removal.

c. AIR FILTERS.—Air filters may be removed by first removing the fuse panel drawer assembly; and then sliding out the filters from their container on the top deck of the cabinet. Air filters under usual operating conditions should be replaced every three months. When infrequently used or when at sea where dust and oil fume conditions are not prevalent, they may be replaced every six months.

4. LUBRICATION.

The tuning mechanisms are fitted with sealed bearings requiring no lubrication. The open gears should be lubricated periodically by a light application of universal gear lubricant MIL-L-2105, Grade 75. The bushings of the dial counters and dial shafts should be lubricated with instrument oil MIL-L-6085.

FAILURE REPORTS

"Report each failure of the equipment, whether caused by a defective part, wear, improper operation, or an external cause. Use ELECTRONIC FAILURE REPORT form DD 787. Each pad of the forms includes full instructions for filling out the forms and forwarding them to the Bureau of Ships. However, the importance of providing complete information cannot be emphasized too much. Be sure that you include the model designation and serial number of the equipment (from the equipment nameplate), the type number of the major unit (from the major unit nameplate), and the type number and reference designation of the particular defective part (from the instruction book). Describe the cause of the failure completely, continuing on the back of the form if necessary. Do not substitute brevity for clarity. And remember—there are two sides to the failure report - - -

"YOUR SIDE"

Every FAILURE REPORT is a boost for you:

1. It shows that you are doing your job.
2. It helps make your job easier.
3. It insures available replacements.
4. It gives you a chance to pass your knowledge to every man on the team.

"BUREAU SIDE"

The Bureau of Ships uses the information to:

1. Evaluate present equipment.
2. Improve future equipment.
3. Order replacements for stock
4. Prepare field changes.
5. Publish maintenance data.

Always keep a supply of failure report forms on board. You can get them from the nearest District Publications and Printing Office."

Figure 7-1. Failure Report, Sample Form

SECTION 7
CORRECTIVE MAINTENANCE

1. INTRODUCTION.

In the normal service life of any piece of equipment, faults and breakdowns will develop. In order that necessary repairs may be made in a reasonably short time, a logical testing routine must be followed. The two-fold purpose of any corrective maintenance procedure is first, the localization of the faulty unit, and second, locating the faulty stage or component. The cause of the trouble must be determined as quickly and accurately as possible. The maintenance technician should familiarize himself with the operating and unit make-up of the equipment prior to the occurrence of trouble. The schematic diagram, figure 7-10 should be referred to frequently as an aid to servicing.

When repairs are necessary it is recommended that the servicing be done, whenever possible, by competent radio technicians, supplied with suitable tools and test equipment.

When working on the equipment remember that 115 volts AC, and that high r-f power may be present. Use extreme caution.

Before proceeding with any extensive repairs, be reasonably sure that performance of this repair will eliminate the trouble. Do not waste time in needless probing or replacement of parts. When trouble is encountered, be logical.

In all repairs and replacements, every attempt should be made to duplicate the original condition of the equipment. Standard replacement parts, such as taken from stock, should be used. Particular care should be taken to run any replacement wiring in the same position and manner as the original wiring. Soft soldering should be done with rosin-core solder. The smallest amount of solder necessary for a good mechanical and electrical joint should be used. Do not permit excess solder to drop on other components, or remain within the chassis.

In the event of emergency repairs, where it is impossible to make exact replacement of parts, the same care and workmanship must be taken. The temporarily repaired equipment should be conspicuously marked or tagged to indicate the temporary nature of the repair, and should be restored to its original condition at the first possible opportunity.

2. LOCALIZING OF TROUBLE.

In servicing the equipment, defective components causing inoperation should be localized as quickly and efficiently as possible. Each coupler group is divided into six major units. It is suggested that the following procedure be used in trouble shooting: Observe all meters for abnormal indications; observe indicator lamp on Fuse Panel SB-407/SRA-16 to determine if fuse panel is operative. Also, note any other visual or aural indications that may help isolate the stage at fault.

Check accessible components first. A defective circuit and its associated components should be checked systematically for continuity, defective resistors, shorted capacitors, loose connections, etc. Test equipment such as a volt-ohm-milliammeter with 20,000 ohms per volt sensitivity or better should be used for these tests .

When performing continuity checks or resistance measurements, take into account other components which may be in shunt with the part under test. For accurate results, disconnect one lead of the part being checked before proceeding with measurements.

3. SYSTEM TROUBLE SHOOTING.

System trouble shooting utilizes meters, switches, controls, etc. of a coupling group to isolate the fault to one of the units comprising the equipment. The unit trouble-shooting procedure given in paragraph 4 of this section is to isolate the fault within the unit to a particular circuit, stage, or component. In some cases, depending upon the circumstances, it may be quicker to replace the unit with one that is known to be in good working condition, if such a unit is available.

4. UNIT TROUBLE SHOOTING.

Unit trouble shooting requires detailed knowledge of the unit and may necessitate a review of the theory given in Section 2 for the particular unit. Some units depend upon mechanical devices for proper operation and repair of such items, such as the tuning and coupling systems, may be required to correct the trouble. A basic principle of trouble shooting is to proceed first with the simple and obvious, and then by orderly steps to the more complex and unusual troubles. The trouble-shooting chart in figure 7-2 presents information in a logical step-by-step fashion for the more common defects that may be encountered in the equipment.

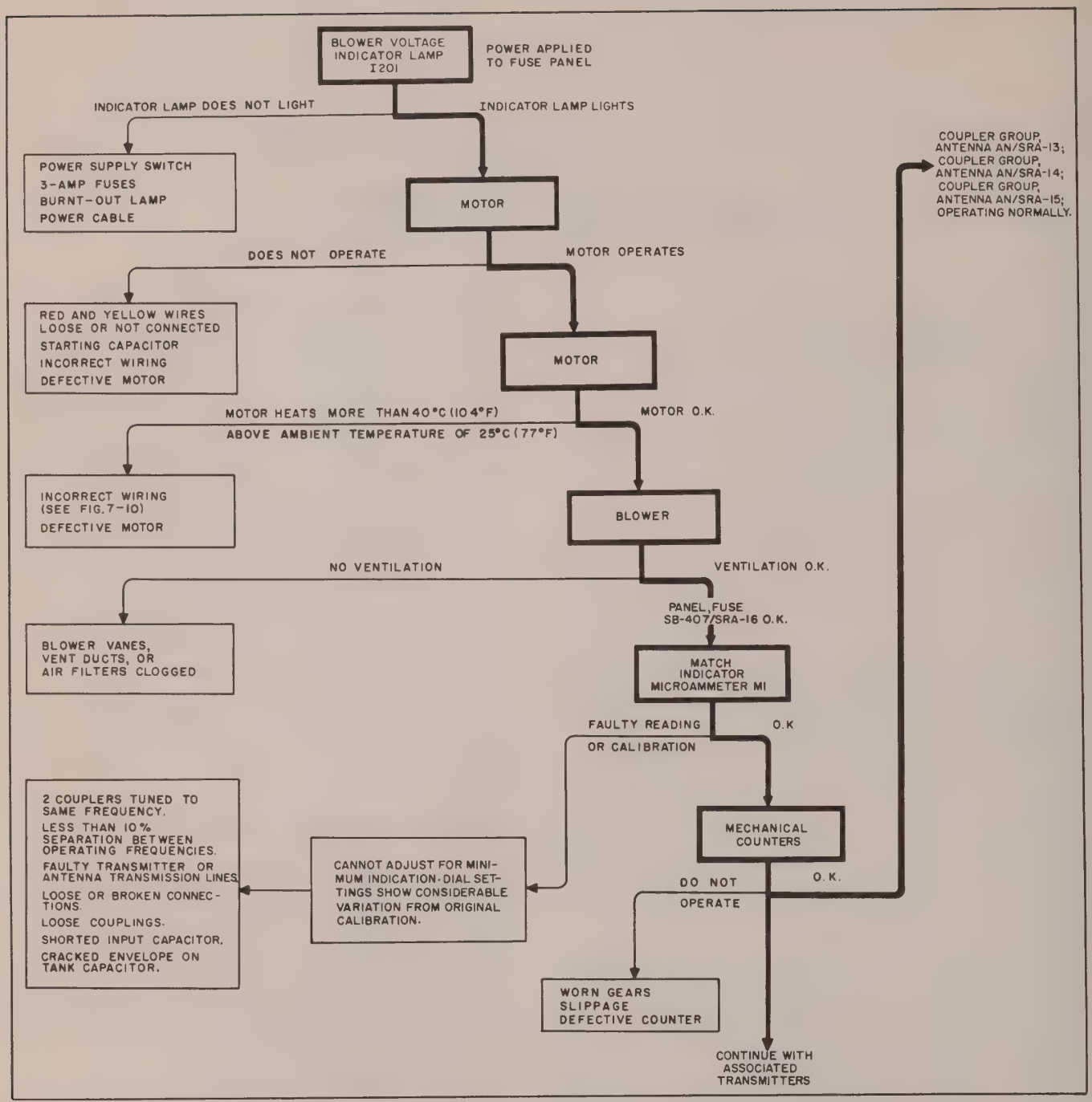


Figure 7-2. Fuse Panel and Antenna Coupler Trouble Shooting Chart

5. REMOVAL AND REPLACEMENT.

a. GENERAL.—Step-by-step procedures are given below for the removal and replacement of certain maintenance parts, such as vacuum capacitors and mechanical counters, which are considered short lived and can be replaced by maintenance personnel. The replacement of other parts, such as the variable air-dielectric capacitor, radio-frequency coil, gears, shafts, etc., requires the complete removal, breakdown, rebuild, and readjustment of the entire unit together with any parts or assemblies with which it is associated. Such work must be performed in the shop where skilled overhaul mechanics are available, after which the reassembled unit must be retested and recalibrated for its operating frequency as described in Section 3, paragraph 5.

b. TANK TUNING CAPACITOR C3. (See Figures 7-5, 7-6 and 7-7.)

(1) REMOVAL.—Proceed as follows:

(*a*) Set TUNING dial and tuning mechanical counter to 0.

(*b*) Remove antenna coupler from cabinet as directed in Section 6, paragraph 3.*a*.

(*c*) Remove the three machine screws, flat washers, and lock washers from panel side of coupling assembly O-15. It will be necessary to rotate coupling assembly O-15 to remove these screws.

(*d*) Remove the four screws and lock washers from the cast-iron cap of mounting bracket O-72. Remove bearing cap.

(*e*) Remove capacitor mounting clip O-64 at tip end of capacitor C3.

(*f*) Loosen (do not remove) the two setscrews on panel side of coupling assembly O-15, using No. 6 Allen wrench. It will be necessary to rotate coupling assembly O-15 to loosen these screws.

(*g*) Lift out capacitor C3 from its cradle, using both hands.

(2) REPLACEMENT.

(*a*) Measure replacement capacitor C3 and make sure its dimensional tolerances are such that it will fit into the old cradle. If it does not fit, secure another replacement capacitor.

(*b*) Remove reducing fitting bushing O-16 from the thimble of removed capacitor C3 and install it on replacement capacitor C3, also coupling O-15.

(*c*) Set replacement capacitor C3 to minimum capacity position by rotating shaft counterclockwise until capacitor is completely open, and then rotating the shaft one turn in a clockwise direction.

(*d*) Install replacement capacitor C3 (fitted with bushing O-16 and with coupling O-15 on shaft) in the capacitor mounting cradle, but do not tighten the setscrews.

(*e*) Replace the three machine screws, flat washers, in near side of coupling assembly O-15, rotating the coupling assembly as required.

(*f*) Replace the cast-iron cap and the four machine screws and lock washers on capacitor mounting bracket. Tighten screws.

(*g*) Install mounting clip O-64 on tip end of replacement capacitor C3.

(*h*) Set TUNING control counter and dial to zero. Tighten the two setscrews previously loosened in coupling assembly O-15, using No. 6 Allen wrench, just enough to permit driving the capacitor shaft.

(*i*) Reinstall the coupler drawer assembly in the cabinet. Using a 50-ohm dummy load, if available, or with the regular antenna line connected, energize the coupler unit at 16 mc. Set the control marked COUPLING in accordance with the setting on the calibration chart. Adjust the control marked TUNING for minimum reading on the match-indicator microammeter. Note the reading on the mechanical counter associated with the TUNING control. Then proceed with calibration adjustment as described in paragraph 6.*a*. below.

c. COUPLING CAPACITOR C4-1 AND COMPENSATING CAPACITOR C4-2. (See Figures 7-6 and 7-7.)

(1) REMOVAL.

(*a*) Remove drawer assembly from cabinet as directed in Section 6, paragraph 3.*a*.

(*b*) Coupling capacitor C4-1 and compensating capacitor C4-2 are critical in their adjustment and care must be exercised in resetting them when replacement is necessary. Therefore, before removing either of these capacitors, rotate control marked COUPLING to its zero setting and lock it; also see that all numerals on its associated mechanical counter register zero. This corresponds to the setting for minimum coupling capacity and maximum compensating capacity.

(*c*) Loosen the machine screw and lock washer in each of two clamps O-61 at the two ends of capacitor C4-1 or C4-2. This will permit removal of the two clamps by sliding them off the two ends of the capacitor.

(*d*) Lift up and pull out the defective capacitor (with spur gear O-59 attached) from mounting clips on which it rests.

(*e*) Loosen the setscrew in spur gear O-59, using No. 4 Allen wrench, and slide spur gear O-59 off shaft of the capacitor to be replaced.

(2) REPLACEMENT.

(*a*) Slide spur gear O-59 on shaft of replacement capacitor but do not tighten the setscrew.

(*b*) Install the replacement capacitor with spur gear O-59 attached in its proper mounting clips.

(*c*) If the replacement capacitor is the coupling capacitor C4-1, set it at minimum. If the replacement capacitor is the compensating capacitor C4-2, set it at maximum. To do this without confusion, first observe whether the capacitor remaining (the one not removed) is open or closed. If the capacitor remaining is open, see that the replacement capacitor is compressed by turning the shaft by hand until it is closed all the way, then open it one turn. If the capacitor remaining is closed, see that the replacement capacitor is opened all the way by turning the shaft by hand, then compress it one turn. To close the capacitor, turn counterclockwise; to open it, turn clockwise (both motions refer to the shaft end).

(*d*) After completing the minimum capacity setting step (*c*) above, align spur gears O-59 and tighten setscrew, using No. 4 Allen wrench.

(*e*) Replace clamps O-61 on both ends of capacitor, and tighten the two rd-hd, machine screws and lock washers at the two ends of the replacement capacitor.

(*f*) Unlock COUPLING dial, and reinstall the coupler drawer assembly in the cabinet. Then make dial calibration adjustment as directed in paragraph 6.*b*. below.

d. ROTATING COUNTER M2-COUPLING CONTROL. (See Figure 7-7.)

(1) REMOVAL.

(*a*) Remove coupler drawer assembly from cabinet as directed in Section 6, paragraph 3.*a*.

(*b*) Turn COUPLING control knob so its dial registers zero and all numerals on rotating counter M2 register zero. Lock dial.

(*c*) Remove the two flat-hd, machine screws, hex-nuts, and external lockwashers which fasten counter M2 to front panel of coupler.

(*d*) Remove counter M2 with its extension shaft and attached miter gear O-52 (16 teeth).

(*e*) Remove extension shaft (with miter gear O-52 attached) from counter M2 first loosening the setscrew, using No. 4 Allen wrench.

(2) REPLACEMENT.

(*a*) Slide extension shaft (with miter gear O-52 attached) on replacement counter M2 and tighten setscrew, using No. 4 Allen wrench.

(*b*) Turn replacement counter M2 so all numerals register zero and hold counter at that registry. Also keep dial of COUPLING control locked at zero.

(*c*) Align miter gears O-51 and O-52 (each has 16 teeth) and mount new counter M2 in its proper location, using the two flat-hd, machine screws, hex-nuts, and external-tooth lockwashers.

(*d*) Replace the coupler drawer assembly in the cabinet.

Note

Replace both miter gears O-51 and O-52, if either is found worn, or otherwise unusable, during the process of replacing counter M2. When doing so, be sure to use set of matched gears. Use gear compound to enmesh gears, if needed.

e. ROTATING COUNTER M3-TUNING CONTROL. (See Figures 7-6 and 7-7.)

(1) REMOVAL.

(*a*) Remove coupler drawer assembly from cabinet as directed in Section 6, paragraph 3.*a*.

(*b*) Remove ammeter M1 by removing the three rd-hd, black machine screws which fasten meter to front panel, and by loosening the hex-nuts which connect the two wires to the terminals of the meter. Do not remove wires.

(*c*) Remove the panel nut which fastens switch S1 to front panel.

(*d*) Remove the four binding-head machine screws, hex-nuts, and external-tooth washers which fasten directional coupler DC1 (with meter case attached) to front panel of coupler.

(*e*) Loosen bracket supporting directional coupler DC1 on gusset plate by removing the one binding-head machine screw, hex nut, and external-tooth lockwasher.

(*f*) Disengage cable assemblies W1 and W2 from directional coupler DC1. Slide out DC1 with meter case and one end of supporting bracket still attached. Push directional coupler DC1 and switch S1 to one side without disconnecting the wires connected to them. (See figure 7-6.)

(*g*) Turn TUNING control knob so its dial registers zero and all numerals on rotating counter M3 register zero. Lock dial.

(*h*) Remove the two flat-head, machine screws, hex nuts, and external-tooth lockwashers which fasten counter M3 to front panel of coupler.

(*i*) Remove counter M3 with miter gear O-6 (18 teeth) attached to counter shaft. Remove miter gear O-6 from counter shaft by loosening setscrew with No. 4 Allen wrench. This completes the removal.

(2) REPLACEMENT.

(*a*) Slide miter gear O-6 on shaft of new counter M2 and tighten setscrew, using No. 4 Allen wrench.

(*b*) Turn replacement counter M3 so all numerals register zero and hold counter at that registry. Also keep dial of TUNING control locked at zero.

(*c*) Align both miter gears O-6 (each has 18 teeth)and mount new counter M3 in its proper location, using the two flat-head, machine screws, hex-nuts, and external-tooth lockwashers.

(*d*) Reposition directional coupler DC1 with meter case and supporting bracket, also switch S1 in their proper location. Fasten directional coupler DC1 to front panel with the four binding-head machine screws, hex-nuts, and external tooth lockwashers. Fasten supporting bracket with the one binding-head machine screw, hex-nut, and external-tooth washer. Fasten switch S1 to front panel with hex-nut. Reconnect cable assemblies W1 and W2.

(*e*) Reposition meter M1 and refasten leads to ammeter terminals, making certain that the orange lead and resistor are connected to the positive (+) terminal of the meter.

(*f*) Refasten meter M1, using the three round-head, black, machine screws.

(*g*) Replace the coupler drawer assembly in the cabinet.

Note

Replace both miter gears O-6, if either is found worn or otherwise unusable, during the process of replacing counter M3. When doing so, be sure to use a new set of matched gears. Use gear compound to enmesh gears if needed.

f. AIR-DIELECTRIC CAPACITOR C1, RADIO-FREQUENCY COIL L1, AND ASSOCIATED PARTS. —The replacement of air-dielectric capacitor C1 and radio-frequency coil L1 is generally unnecessary due to their rugged construction. Likewise, the replacement of their associated parts, such as gears, shafts, and couplings, is usually not required as these are built of stainless steel or nickel-plated brass and have self-lubricating

bearings on all of which very little wear is anticipated. If, however, due to battle damage or other reasons, such parts do require replacement, it is usually necessary to disassemble and rebuild the entire chassis. This involves the removal of the right and left-hand gussets, affected assemblies and subassemblies, associated dowels and bolts which fasten these parts to the chassis, and the disconnection and removal of coaxial cables, gears, shafts, couplings and other parts with which they are associated. It also involves the removal of setscrews in the various couplings so these can be slid back along their shafts. When reassembling the equipment, it is necessary in most cases to provide new shafts due to variance in tolerances of the replaced parts. Also, gear compound must be used to properly enmesh any new gears that may be needed. Variation in tolerances of electrical parts, such as the thickness of silver plating on the r-f coil, may affect the electrical characteristics of the coupler and require a retest and recalibration of the complete equipment. For these reasons, a complete overhaul job is usually recommended. For details of these assemblies and subassemblies, see figures 7-4, 7-5, 7-6 and 7-7.

g. DIRECTIONAL COUPLER DC1 AND METER CASE ASSEMBLY.—The removal and replacement of parts in directional coupler DC1 and meter case assembly are obvious. To obtain access to parts in directional coupler DC1, remove the cover plate by removing the eight machine screws and lock washers. To obtain access to parts in the meter case assembly, displace directional coupler DC1 with meter case and bracket attached from front panel as described in paragraph 5.*e.*(1), (*b*) through (*f*). Reassemble as described in paragraph 5.*e.*(2), (*d*) through (*f*).

h. MISCELLANEOUS PARTS.—The removal and replacement of miscellaneous parts such as thumbscrews H1 and H2, blower motor B301, starting capacitor C301 etc. are obvious and will not be detailed.

6. ADJUSTMENT OF VACUUM-TYPE CAPACITORS.

a. CAPACITOR C3.

(1) One revolution of the drive shaft is equivalent to ten divisions on the mechanical counter associated with the TUNING control. Hence, the difference between the original TUNING control calibration on the chart and the new reading obtained for the same frequency indicates the correction necessary in the replacement tank tuning capacitor to return to the original calibration.

(2) If, for example, the new reading on the counter is 20 divisions higher than the original calibration, first deenergize the coupler unit and remove it from the cabinet. Then, loosen the four screws securing the cast-iron bearing cap over the tank tuning capacitor thimble and remove mounting clip O-64. Capacitor C3 can then be rotated by hand while the drive shaft remains stationary. Turn capacitor C3 clockwise (referred to the shaft end) through two complete revolutions. Conversely, if the new reading on the counters is 20 divisions lower than the original calibration, capacitor C3 should be turned counterclockwise through two revolutions. Tighten the four screws securing the bearing cap and replace locking clip O-63.

(3) Return the coupler unit to the cabinet, energize the equipment, and readjust the TUNING control for minimum reading on the match indicator meter. The setting should now be fairly close to the original calibration. If there is still a discrepancy, repeat the above process until the counter reading agrees with the original calibration.

b. CAPACITORS C4-1 AND C4-2.

(1) With the antenna system connected, energize the coupler unit at its lowest calibrated frequency. Set the TUNING and COUPLING controls according to this calibration. Observe the reading on the microammeter of the match indicator circuit. If the microammeter reading is up scale, adjust the COUPLING control for minimum reading with SENSITIVITY switch in HIGH position. The difference between the new setting of the COUPLING control and original setting indicates the correction necessary in the setting of the replacement capacitor.

(2) De-energize the coupler unit and withdraw the coupling assembly from the cabinet. Loosen clamps O-61 at the two ends of the replacement capacitor, and lock the dial on the COUPLING control. Then, if the new setting of the COUPLING control is higher than the original calibration, reset the COUPLING control at the original calibration and lock the dial. With clamps O-61 loosened at each end, rotate the capacitor body clockwise (referred to the shaft end). One revolution of the capacitor is equivalent to ten divisions (numerals) on the mechanical counter. Hence, the ratio of the difference between the original setting of the COUPLING control on the calibration chart and the new setting of the COUPLING control, related to 10, is the number of shaft revolutions, or part of a shaft revolution, necessary to correct the replacement capacitor calibration.

(3) Tighten clamps O-61 and reinstall the coupler drawer assembly in the cabinet.

TABLE 7-1. WINDING DATA

Designation Symbol	Part No.	Diagram	Winding	Wire Size	Turns	D-C Resistance in Ohms	Impedance Ratio	Remarks
COUPLER, ANTENNA CU-422/SRA-16								
L1			Single	0.187 D 2-3/4 ID 3-1/8 OD 7.0 lg	11	Less than 1		Taps at, 3-1/2 T, 3-0 T, 4-1/2 T, from left
COUPLER, ANTENNA CU-423/SRA-16								
L1		Same as L1 of CU-422/SRA-16						
COUPLER, ANTENNA CU-424/SRA-16								
L1		Same as L1 of CU-422/SRA-16						
COUPLER, ANTENNA CU-425/SRA-16								
L1		Same as L1 of CU-422/SRA-16						

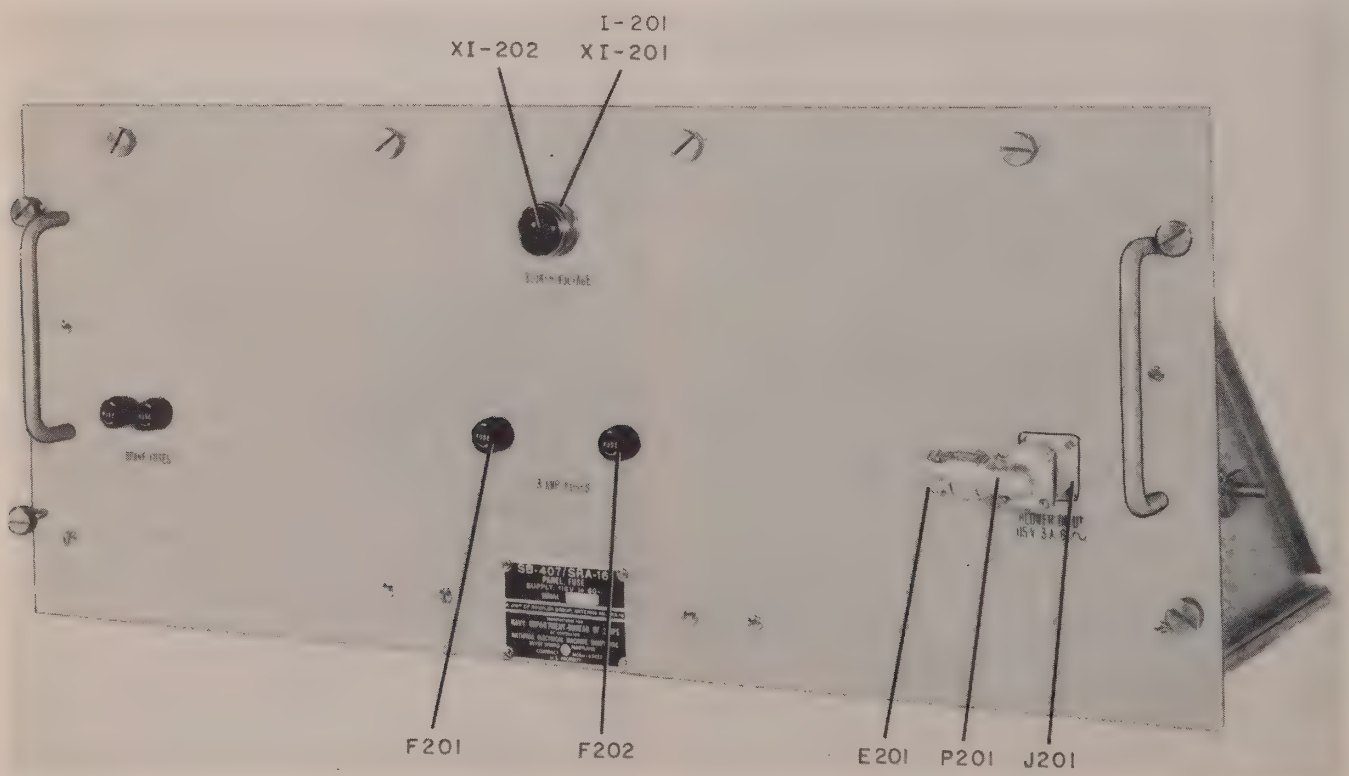


Figure 7-3. Panel, Fuse SB-407/SRA-16, Front Oblique View, Location of Parts

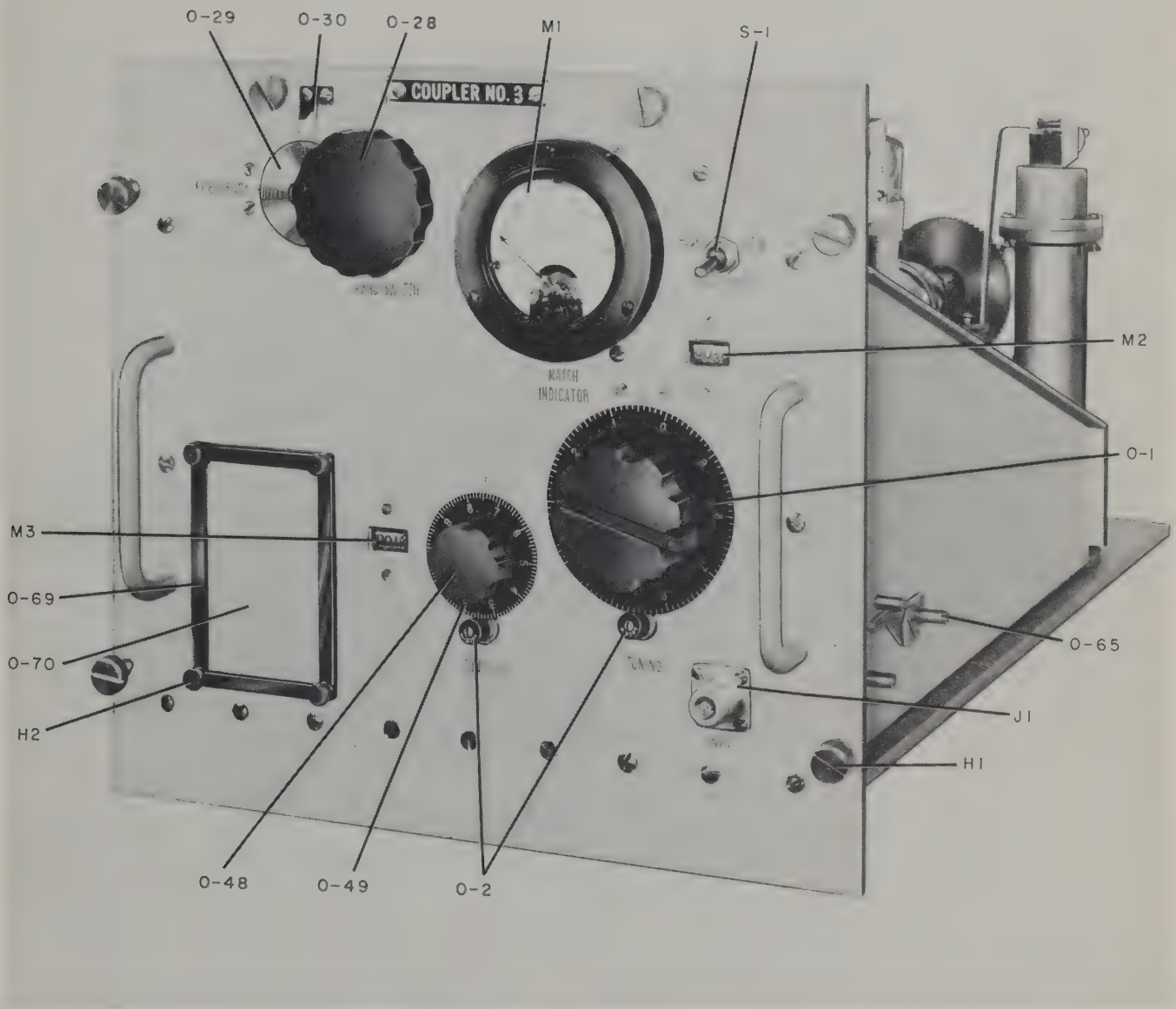


Figure 7-4. Coupler, Antenna CU-424/SRA-16, Front Oblique View, Location of Parts

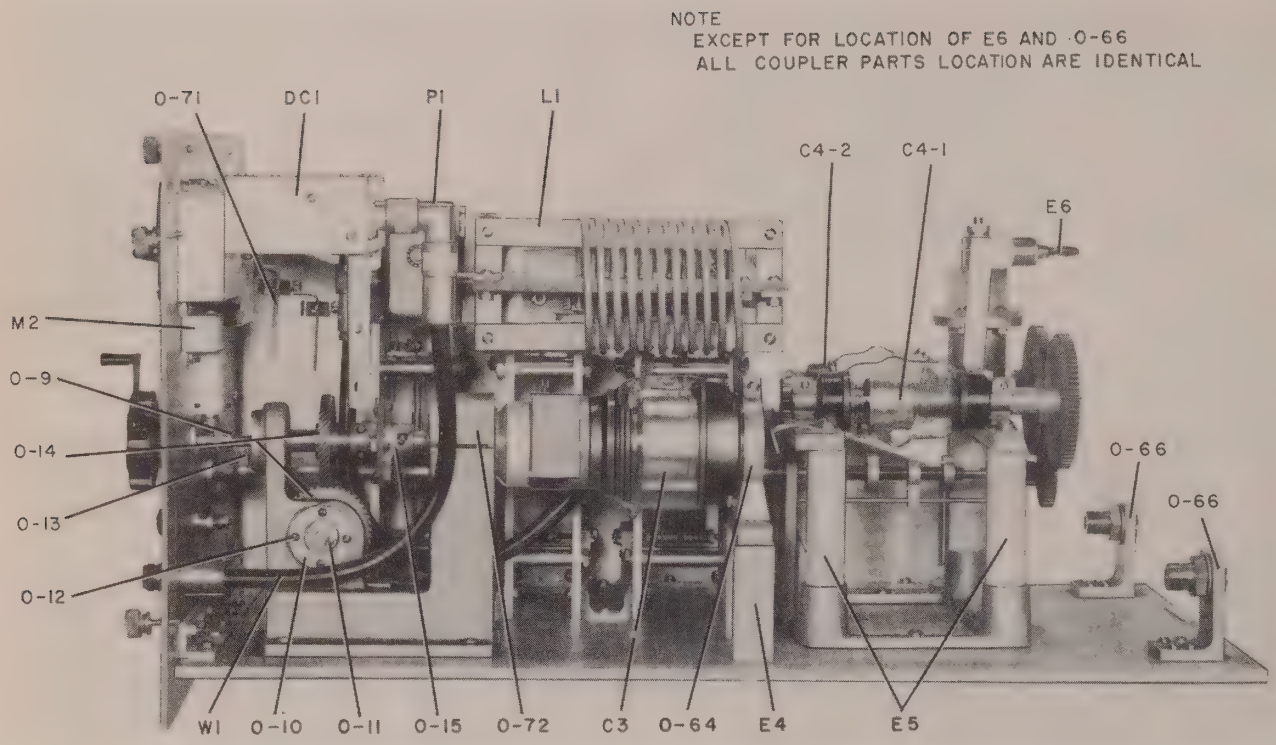


Figure 7-5. Coupler, Antenna CU-422/SRA-16, Right View, Location of Parts

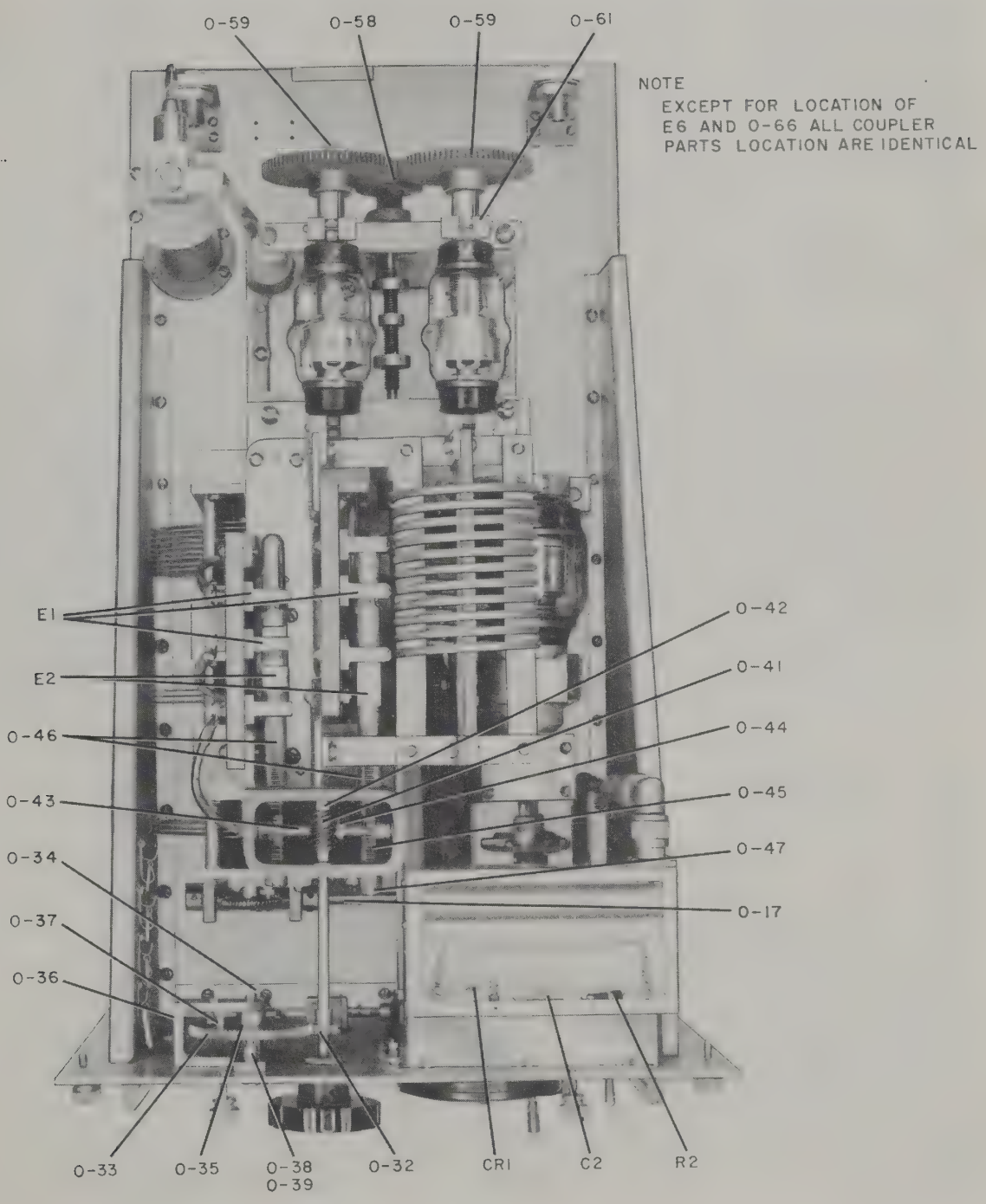


Figure 7-6. Coupler, Antenna CU-422/SRA-16, Top View, Location of Parts

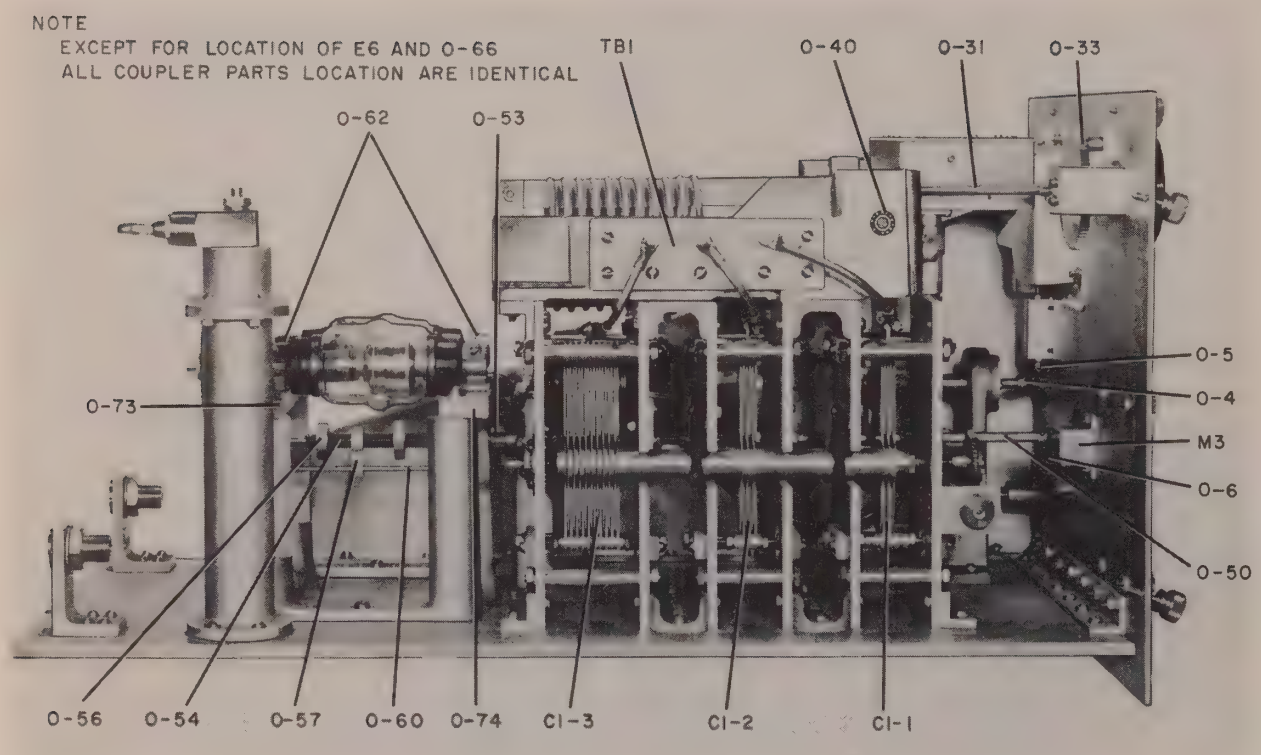


Figure 7-7. Coupler, Antenna CU-422/SRA-16, Left View, Location of Parts

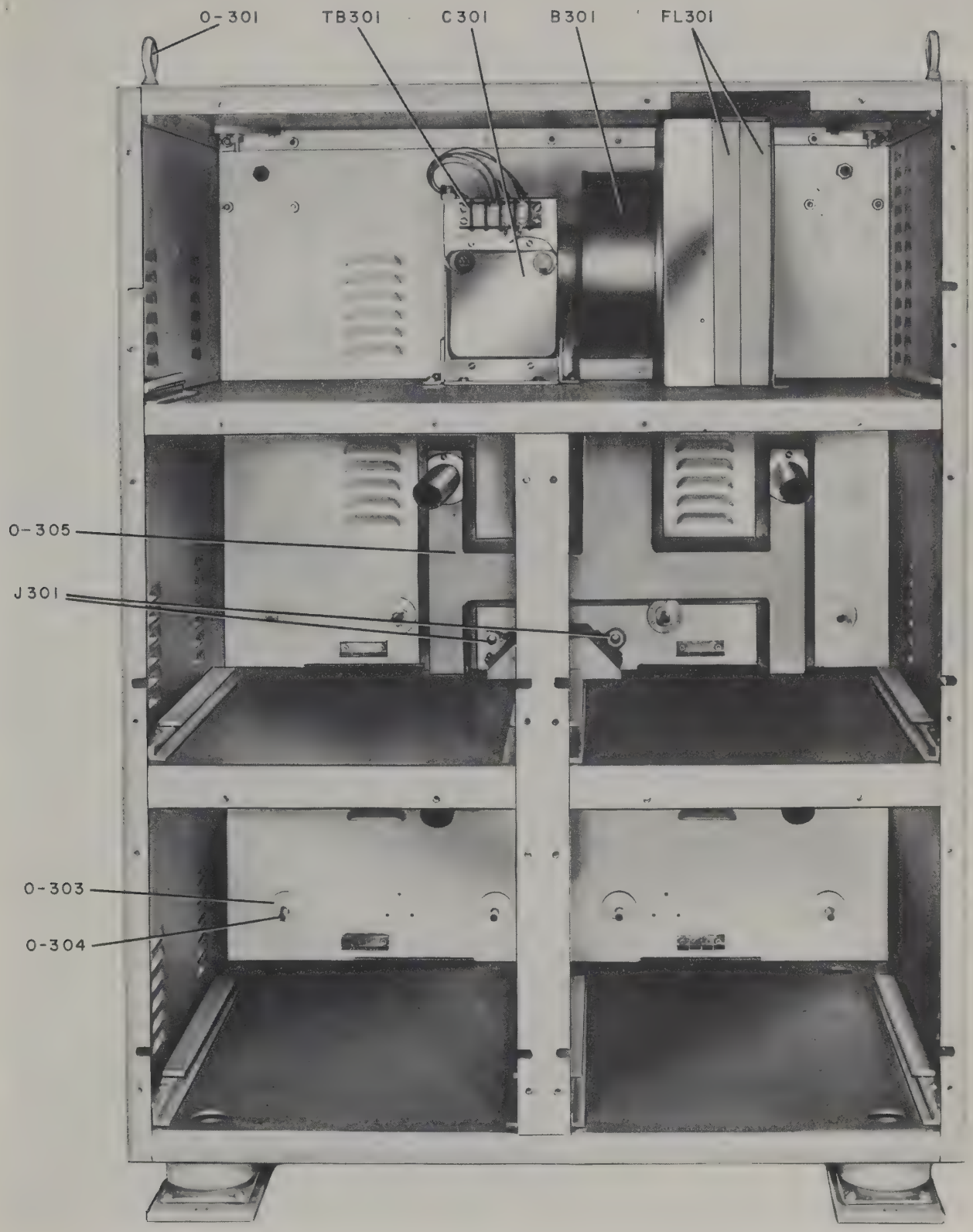


Figure 7-8. Cabinet, Electrical Equipment CY-1671/SRA-16, Interior View, Location of Parts

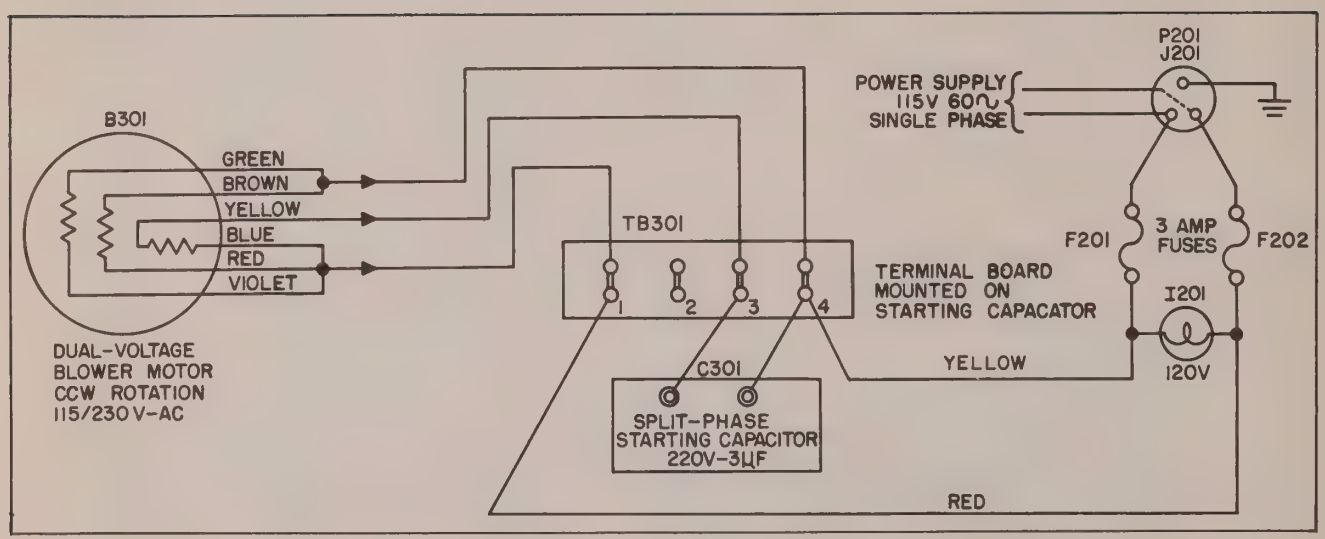
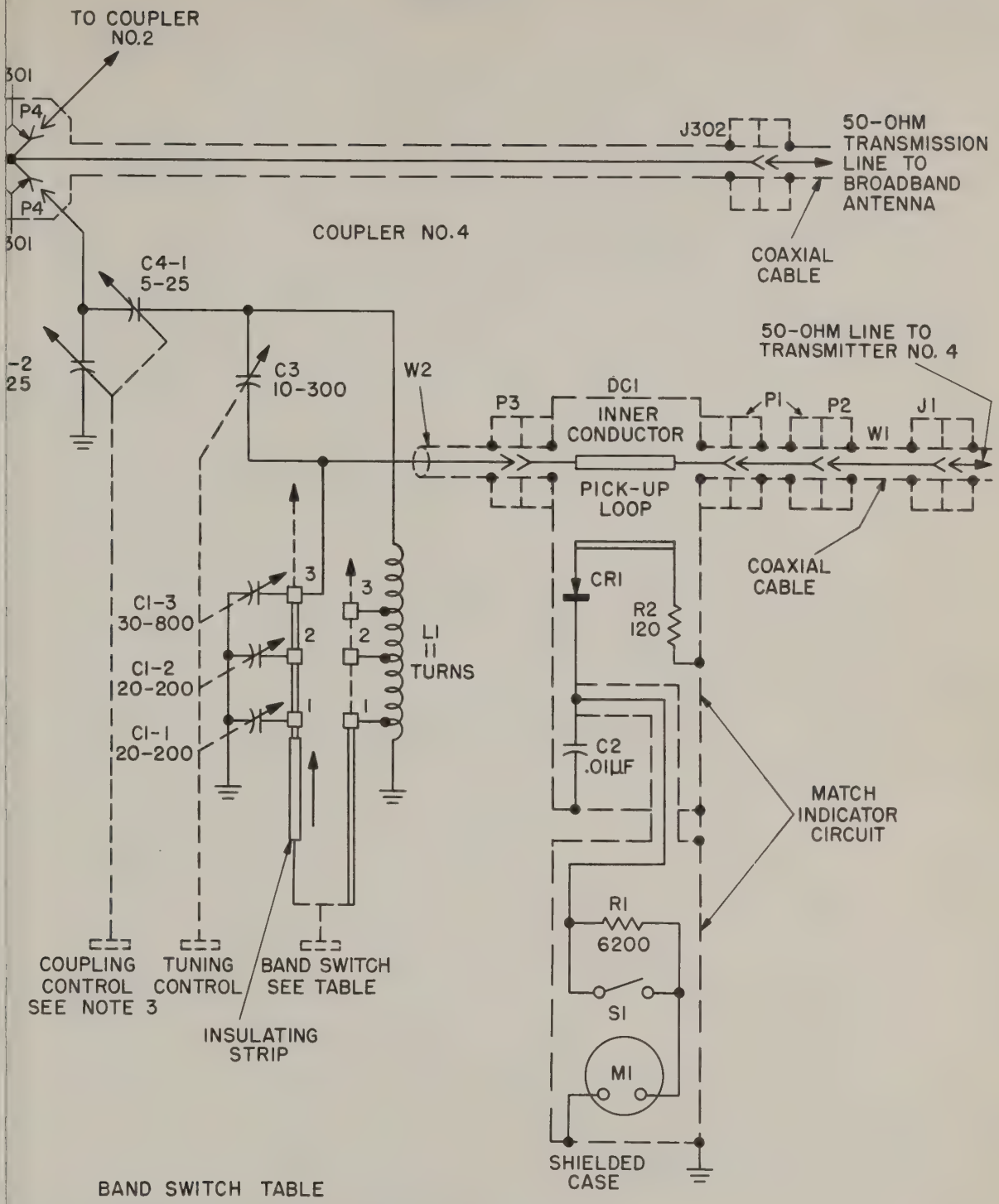


Figure 7-9. Antenna Coupler Group AN/SRA-16, Power Distribution Diagram



BAND SWITCH TABLE

FREQUENCY BAND(MC)	EFFECTIVE TURNS IN L1	CAPACITORS IN PARALLEL
9-12	11	C1-1, C1-2, C1-3
12-18	7	C1-2, C1-3
18-26	4	C1-3

Figure 7-10. Antenna Coupler Group, AN/SRA-16, Schematic Diagram

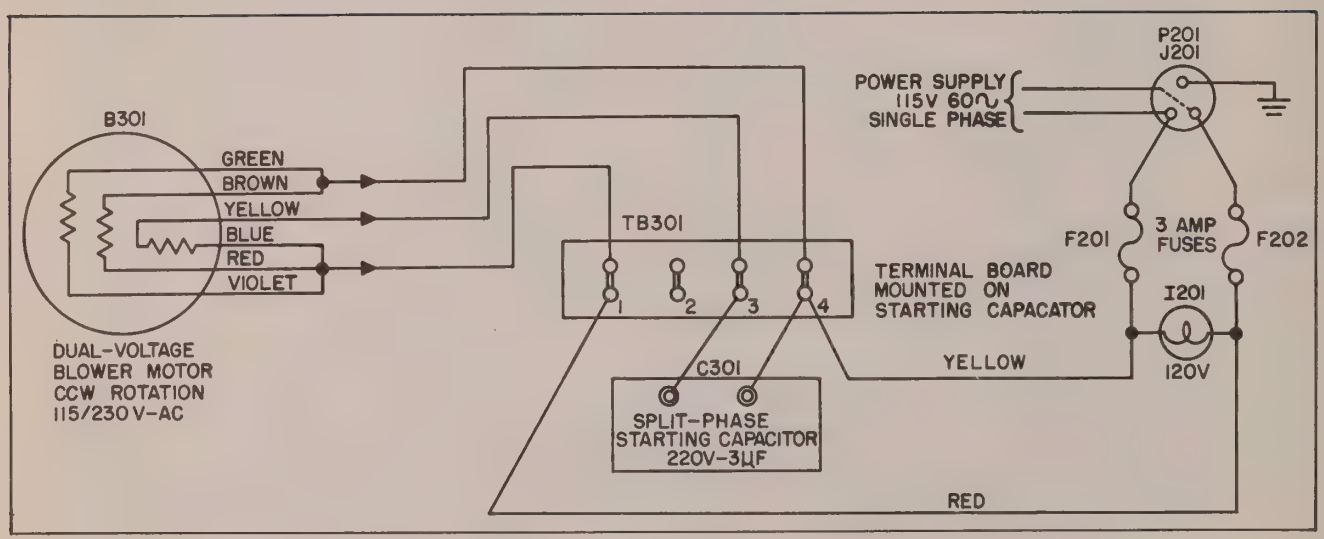
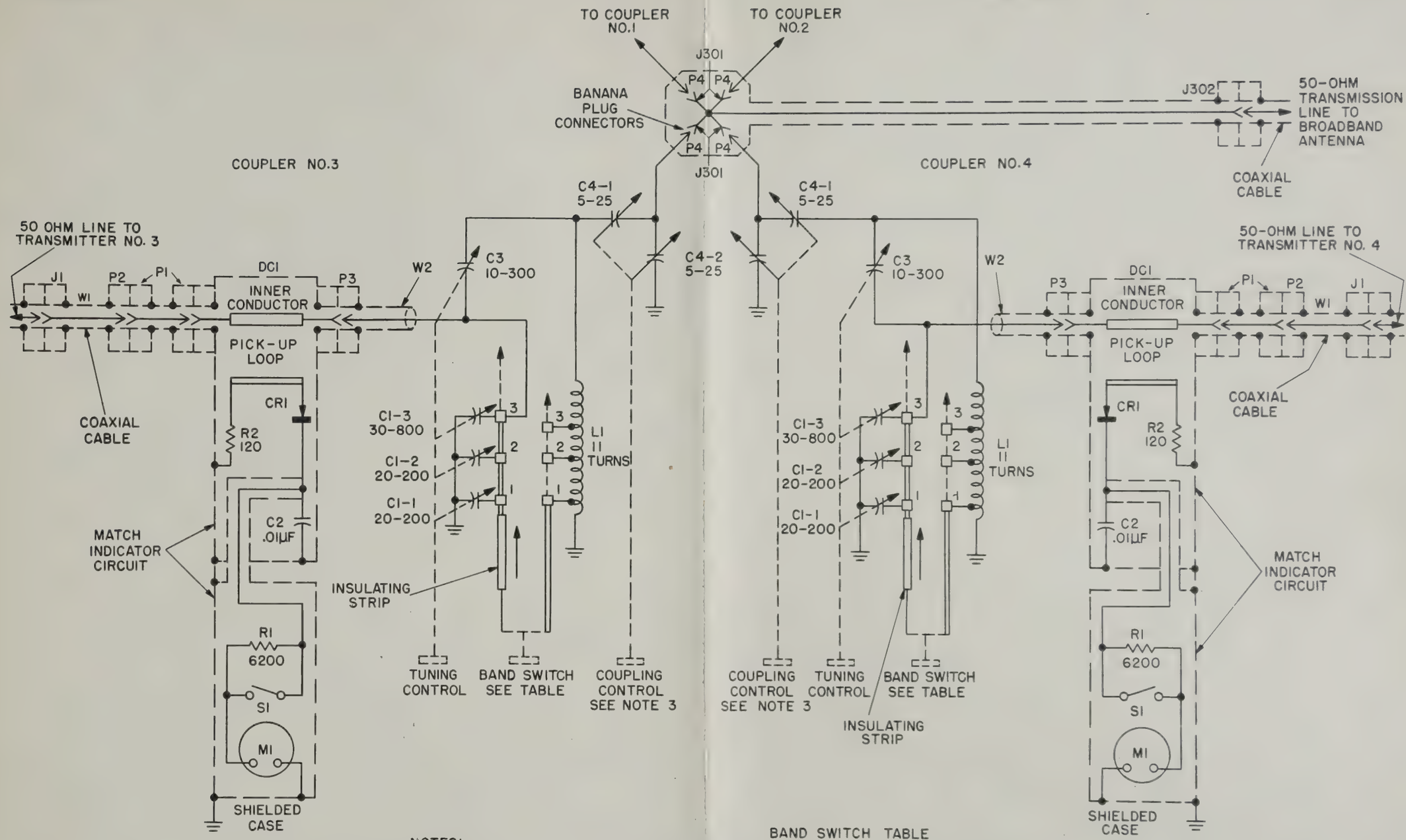


Figure 7-9. Antenna Coupler Group AN/SRA-16, Power Distribution Diagram



NOTES:

1. ALL RESISTANCE VALUES ARE IN OHMS.
2. UNLESS OTHERWISE INDICATED ALL CAPACITORS VALUES ARE IN MICROMICROFARADS.
3. CAPACITORS C4-1 AND C4-2 ARE GANGED SO THAT THE CAPACITANCE OF ONE DECREASES AT THE SAME RATE AS THE OTHER INCREASES AND VICE-VERSA.

BAND SWITCH TABLE

SWITCH POSITION	FREQUENCY BAND(MC)	EFFECTIVE TURNS IN L1	CAPACITORS IN PARALLEL
1	9-12	11	C1-1, C1-2, C1-3
2	12-18	7	C1-2, C1-3
3	18-26	4	C1-3

Figure 7-10. Antenna Coupler Group, AN/SRA-16, Schematic Diagram

SECTION 8

PARTS LIST

1. INTRODUCTION.

Reference designations (previously referred to as circuit symbol, reference symbol, etc.) have been assigned to identify all maintenance parts of the equipment. They are used for marking the equipment (adjacent to the parts they identify) and are included on drawings, diagrams, and the parts list. The letters of a reference designation indicate the kind of part (generic group) such as resistor, amplifier, electron tube, etc. The number differentiates between parts of the same generic group. Parts of the first major unit are numbered from 1 to74; parts of the second 201 to 202 and parts of the third 301 to 305, etc. Sockets associated with a particular plug-in device, such as a fuse, are identified by a reference designation which includes the reference designation of the plug-in device. For example, the socket for fuse F202 is designated XF201.

2. MAINTENANCE PARTS LIST.

Table 8-1 lists all major units and their maintenance parts. Each major unit's parts are grouped together.

Column 1 lists the reference series of each major unit followed by the reference designation of the various parts in alphabetical and numerical sequence.

Column 2 includes a reference to the explanatory notes that are listed in paragraph 5 below.

Column 3 includes the name and description of the various items. Complete information is provided for all key parts (a part that differs from any part previously listed in the table) and sub-key parts (a part that is identical to a key part, but appears for the first time for a given major unit). The name and description is omitted for other parts. However, reference is made to the key or sub-key part for the data.

Column 4 indicates how the part is used and provides its functional location in the equipment.

3. SUPPLEMENTARY TABLE 8-1A.

For Coupler Groups, Antenna AN/SRA-16A, consult Table 8-1A, Supplemental Maintenance Parts List for changes, if any, from corresponding parts in basic models. Since the new Stock Number Identification Tables (SNIT) issued by the Electronic Supply Office, contains up to date Federal Stock Numbers, and Source, Maintenance and Recoverability Coders, Table 8-2, Stock Number Identification, has been deleted. Consult SNIT for Stock Number information.

4. LIST OF MANUFACTURERS.

Table 8-3 lists manufacturers of parts used in the equipment. The prefix letters are those assigned by the Bureau of Ships to identify the manufacturers, on identification plates (nameplates) and on small parts.

5. NOTES.

The following provides additional information about items listed in tables 8-1 and 8-2.

a. Fabricate locally from bulk material having the stock number listed in table 8-2.

b. Manufacture in a Navy Shop.

c. Will be procured on demand by the nearest Naval Shore Supply Activity.

d. Non-replaceable in this application. Listed for reference only.

e. Replace by adapting or modifying the standard item having the stock number listed in table 8-2. Modify as indicated in the description.

f. Replace with substitute part having the stock number listed in table 8-2.

g. Assumed to be a low-failing item. If failure occurs, order replacement from ESO, referencing NavShips 900,180A.

h. Not used.

i. Used in Antenna Couplers CU-422/SRA-16 and CU-423/SRA-16 only.

j. Assemble from component parts.

TABLE 8-1. MAINTENANCE PARTS LIST

ANTENNA COUPLER CU-422/SRA-16
ANTENNA COUPLER CU-423/SRA-16
ANTENNA COUPLER CU-424/SRA-16
ANTENNA COUPLER CU-425/SRA-16

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
1-99	(d)	COUPLER, ANTENNA CU-422/SRA-16; matches 50-ohm impedance of r-f transmission line; 2 term, input coax type, output ins feed-through type; c/o 4 variable capacitors, one spiral wound coil; one directional coupler, one match indicator; one bandswitch; 12-3/8 in. h x 13-3/4 in. wd x 24-3/4 in. d o/a; cabinet mounted on pull-out slides, forced air cooling; frequency range 9 to 26 mc; rated at 500 w; NEMS-CLARKE part/dwg #AJ-13,859-1.	Antenna coupling unit
1-99	(d)	COUPLER, ANTENNA CU-423/SRA-16; matches 50-ohm impedance of r-f transmission line; 2 term, input coax type, output ins feed-through type; c/o 4 variable capacitors, one spiral wound coil; one directional coupler, one match indicator; one bandswitch; 12-3/8 in. h x 13-3/4 in. wd x 24-3/4 in. d o/a; cabinet mounted on pull-out slides, forced air cooling; frequency range 9 to 26 mc; rated at 500 w; NEMS-CLARKE part/dwg #AJ-13,859-2.	Antenna coupling unit
1-99	(d)	COUPLER, ANTENNA CU-424/SRA-16; matches 50-ohm impedance of r-f transmission line; 2 term, input coax type, output ins feed-through type; c/o 4 variable capacitors, one spiral wound coil; one directional coupler, one match indicator; one bandswitch; 12-3/8 in. h x 13-3/4 in. wd x 24-3/4 in. d o/a; cabinet mounted on pull-out slides, forced air cooling; frequency range 9 to 26 mc; rated at 500 w; NEMS-CLARKE part/dwg #AJ-13,859-3.	Antenna coupling unit
1-99	(d)	COUPLER, ANTENNA CU-425/SRA-16; matches 50-ohm impedance of r-f transmission line; 2 term, input coax type, output ins feed-through type; c/o 3 variable capacitors, one spiral wound coil; one directional coupler, one match indicator; one bandswitch; 12-3/8 in. h x 13-3/4 in. wd x 24-3/4 in. d o/a; cabinet mounted on pull-out slides, forced air cooling; frequency range 9 to 26 mc; rated at 500 w; NEMS-CLARKE part/dwg #AJ-13,859-5.	Antenna coupling unit
C1		CAPACITOR, VARIABLE, AIR DIELECTRIC: plate meshing type; three sections; capacity approx 10 $\mu\mu$f minimum, 50 $\mu\mu$f maximum; straight-line wave length tuning characteristic, 1000V a-c peak voltage, no trimmers; shaft adjustment 180° cw rotation of the plates; approx 9-3/4 in. over-all length, 3-7/8 in. wd, 6-7/8 in. high; NEMS-CLARKE part/dwg #AD-13,095.	Variable input coupling capacitor
C2	(f)	CAPACITOR, FIXED, MICA DIELECTRIC: commercial type, 0.01 μf $\pm$5%, 500 VDC; Cornell Dubilier type 1DL3S1.	Part of directional coupler DC1
C3		CAPACITOR, VARIABLE, VACUUM DIELECTRIC: 10-300 $\mu\mu$f, 15 KV; type USC Jennings Radio Mfg. Co.	Variable tank tuning capacitor
C4-1		CAPACITOR, VARIABLE, VACUUM DIELECTRIC: 5-25 $\mu\mu$f, 20 KV; type TC Jennings Radio Mfg. Co.	Variable input coupling capacitor
C4-2		Same as C4-1.	Variable compensating capacitor
CR1		CRYSTAL UNIT, RECTIFYING: germanium; #JHS-1N34A; Sylvania per JAN-1A.	Part of directional coupler DC1
DC1	(j)	COUPLER, DIRECTIONAL: assembly consists of a box, cover, resistor (R2), capacitor (C2), crystal (CR1), pick up loop, a tube assembly, and a connector receptacle input on one end and a connector receptacle output on the other end; the pick up loop, tube assembly and connector receptacles are silver soldered to the box and therefore form an integral unit with the box; the box is approximately 4-9/16 in. lg, 3-15/16 in. wd, 2-1/2 in. d; NEMS-CLARKE part/dwg #AC-13,607.	Part of match indicator circuit
E1		CONTACT ASSEMBLY, ELECTRICAL: consists of a guide mount and a contact bushing soldered into one piece; brass, silver plated; 1 in. lg, 5/8 in. wd, 1 in. high; NEMS-CLARKE part/dwg #AA-13,033-1.	3 per unit for shorting out sections of air-dielectric capacitor C1

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-422/SRA-16
ANTENNA COUPLER CU-423/SRA-16
ANTENNA COUPLER CU-424/SRA-16
ANTENNA COUPLER CU-425/SRA-16

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
E2		CONTACT, ELECTRICAL: plungers, brass, silver plate; 2-7/16 in. over-all length, 1/2 in. diam rod; stud 7/16 in. lg with #8-32 thd; NEMS-CLARKE part/dwg #A-12,736.	2 per unit, one shorts out sections of coil assembly L1, and one shorts out sections of air-dielectric capacitor C1
E3	(f)	INSULATOR, STANDOFF: ceramic, white, glazed finish; Isolantite #323L1-1/2.	2 per unit, mounts E2
E4	(f)	INSULATOR, STANDOFF: Isolantite #337L2-1/2.	Mounts vacuum capacitor C3
E5	(f)	INSULATOR, STANDOFF: Isolantite #348L3.	Mounts vacuum capacitors C4-1 and C4-2
E6		BAR ASSEMBLY, OUTPUT: one giant banana plug #674, General Radio Co. and an output bar, NEMS-CLARKE #A-12,560.	Mounts output plug P4
H1	(d)	THUMBSCREW: for mounting calibration chart; #6-32 x 1/2, Parker Kalon.	Mounts frame O-69 on panel
H2		THUMBSCREW: stainless steel; knurled, med diam; section B, reference drawing group 29, A-5/8 in., H-1/2 in., L-1-1/8 in.; cone point; #10-32 thd OD; NEMS-CLARKE part/dwg #A-12,594.	Fastens drawer chassis to cabinet
J1		CONNECTOR, RECEPTACLE: coaxial fitting; UG-22B/U per Navy dwg RF49F402.	Input jack
L1		COIL ASSEMBLY: single layer wound; 11 turns; nilvar rod 0.187 in. diam; silver plate finish; 2-3/4 in. ID of coil loops, 3-1/8 in. OD, 7 in. lg; three contact assemblies NEMS-CLARKE part/dwg #AA-13,033-2 silver soldered to the coil; per NEMS-CLARKE assembly dwg #AC-13,573.	Tank inductance coil
M1	(f)	AMMETER: panel mounted; dc; micro amperes; 0-to-50 cw; full scale; marked "DC"; Weston Model 301; bakelite case with 1/2 in. studs; (MR35W 050 DCUA per MIL-M-6A).	Part of match indicator circuit
M2		COUNTER, ROTATING, FIXED MOUNTING: RH 4-figure counter; case with flange at window; Veeder Root series #1141; shaft rotation #4; modified per NEMS-CLARKE part/dwg #A-12,721.	Geared to "COUPLING" circuit
M3		COUNTER, ROTATING, FIXED MOUNTING: LH 4-figure counter; case with flange at window; Veeder Root series #1141; shaft rotation #3; modified per NEMS-CLARKE part/dwg #A-12,722.	Geared to "TUNING" circuit
O-1	(g)	DIAL ASSEMBLY: scale 0 to 10, left to right, in increments of 10; 3-1/4 in. diam, 1/32 in. thk; three knob mounting holes 0.128 in. diam, 120° apart on 15/32 in. rad; black anodize finish; white engraved markings; NEMS-CLARKE part/dwg #A-12,588-2; knob; 2-1/4 in. diam, 1-1/16 in. lg; folding handle opens to 4 in. diam; 3/16 in. hole; black anodize finish, fluted; NEMS-CLARKE part/dwg #B-12,678-1 per assembly dwg #AC-13,112-1.	Dial assembly for "TUNING" circuit
O-2	(g)	CLAMP, ELECTRICAL: consists of a knob, spacer, pivot guide, pin, special washers, and associated hardware; NEMS-CLARKE part/dwg #AB-13,111.	Locking device for dial assemblies O-1 and O-49
O-3	(g)	BEARING, SLEEVE: assembly consists of a dial drive shaft bearing; brass, nickel plated; 1/2 in. OD, 3/16 in. ID, 3/8 in. lg over-all with 9/16 in. hex flange one end, #1/2-20 thd 1/4 in. d at the other end; Nat'l Elec. Mach. part/dwg #A-12,590-1; and a lock washer, 1/2 in. internal tooth, phosphor bronze, nickel plated; nut 3/4 in. hex x 1/8 in. thk, brass, nickel plated; NEMS-CLARKE part/dwg #A-12,591.	Bearing for frequency-band switching knob O-28
O-4		GEAR, MITER: straight type; brass, nickel plated; 16 teeth; 1/8 in. face; 1/2 in. pitch diam; 1/4 in. bore; #6-32 tapped setscrew hole, taper pin hole 0.078 in. diam half drilled; Chicago Gear Works part #M-103; modified per NEMS-CLARKE part/dwg #A-13,069-3.	Mounts on dial-drive shaft O-9, meshes with gear O-5

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-422/SRA-16
ANTENNA COUPLER CU-423/SRA-16
ANTENNA COUPLER CU-424/SRA-16
ANTENNA COUPLER CU-425/SRA-16

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-5		GEAR, MITER: straight type; brass; 16 teeth; 1/8 in. face; 1/2 in. pitch diam; 3/16 in. bore; #6-32 tapped setscrew hole, taper pin hole 0.078 in. diam half drilled; Chicago Gear Works part #M-103; modified per NEMS-CLARKE part/dwg #A-13,069-2.	Meshes with gear O-4 to operate counter M3.
O-6		GEAR, MITER: straight type; brass; 18 teeth; 7/64 in. face; 3/8 in. pitch diam; 1/8 in. bore; two #4-40 tapped setscrew holes; drilled; Boston Gear Works part #G-461; modified per NEMS-CLARKE part/dwg #A-13,070.	Matched set of gears to operate counter M3
O-7	(b)	BLOCK, BEARING: brass, nickel plated; height 11/16 in.; base 1-3/8 in. x 1 in. including 1/4 in. flange, with 4 tapped mounting holes #43 (0.089) drill #4-40 thd, 1 in. center to center; bearing hole 0.187 in. diam 0.406 in. from base, runs the length of the block; NEMS-CLARKE part/dwg #A-12,729.	Bearing block for counter-drive shaft O-8
O-8	(b)	SHAFT: counterdrive; stainless steel; 5/16 in. OD, 2-9/16 in. lg; section 1-3/4 in. lg has 3/16 in. diam; section 11/16 in. lg has 1/8 in. diam; ring 3/16 in. lg has 5/16 in. diam; NEMS-CLARKE part/dwg #A-12,730.	Drive shaft for counter M3
O-9	(b)	SHAFT: dial drive shaft; stainless steel; 4-5/8 in. lg over-all; 13/16 in. OD; 1/4 in. diam on dial end 2-1/16 in. lg, 1/2 in. diam other end; 1/8 in. keyway; NEMS-CLARKE part/dwg #A-12,609.	Dial drive shaft for "TUNING" circuit
O-10	(g)	BUSHING, PLAIN, FLANGED: shape style No. 2A, section A, 11, Ref Dwg Group 191; aluminum alloy; 1-3/8 in. OD, 0.7812 in. ID, 0.250 in. thk; NEMS-CLARKE part/dwg #A-12,577.	Part of "TUNING" circuit
O-11	(g)	NUT, PLAIN, HEXAGON: CRS, SAE 1020; cad plate finish; finished, cham; drill "F" (0.257) diam and tap #5/16-24; 1/2 in. OD, 1/8 in. thk; NEMS-CLARKE part/dwg #A-12,576.	Part of "TUNING" circuit
O-12		BEARING, BALL: single row, annular; double shield; light duty; 3/8 in. bore; 7/8 in. OD, 7/32 in. wd; 7 balls 5/32 in. diam; std slush grease; New Departure part #77-R-6.	Part of "TUNING" circuit
O-13	(b)	BUSHING, PLAIN, FLANGED: brass, nickel plate; shape style 2A, section A11 Ref Dwg Group 191, dimensions, A-0.375 in. bore, B-1/2 in. diam, C-0.937 in. overall length, D-13/16 in. flange diam, E-1/8 in. flange width; NEMS-CLARKE part/dwg #A-12,575.	To position upper helical gear O-14
O-14		GEAR, HELICAL: single-helical tooth type; steel, cad plate; 45 teeth; 1/4 in. face; 20° pressure angle; 1.9887 in. pitch diam; 45° helix angle; left hand teeth; teeth hardened; 2.0513 in. OD, 5/8 in. bore diam; keyway 1/8 in. x 1/16 in.; NEMS-CLARKE part/dwg #A-12,428.	Operates vacuum capacitor C3
O-15		COUPLING, SHAFT, RIGID: flange type; assembly consists of two 3-fingered flanges with fingers 120° apart; N.R.L. alloy "C"; straight bored 1/2 in. diam shaft hole; fingers 1 in. lg from center of hole; #4-40 tapped hole in each finger on 1-5/8 in. diam; two #6-32 tapped setscrew holes 90° apart; NEMS-CLARKE part/dwg #A-12,422; one coupling disk, phenolic, 2 in. diam, 1/8 in. thk; 6 holes 0.128 in. diam, 60° apart on 1-5/8 in. diam; NEMS-CLARKE part/dwg #A-12,574 per assembly dwg #AA-13,110-1.	Couples drive shaft O-9 to vacuum capacitor C3
O-16	(g)	BUSHING: reducing fitting; Teflon; 1-1/2 in. lg, 1-1/2 in. OD, 1-5/16 in. ID, 3/32 in. thk; tubing; NEMS-CLARKE part/dwg #A-12,804.	Reducing fitting for vacuum capacitor C3
O-17	(b)	SHAFT: stainless steel; 2-13/32 in. lg, 0.625 in. OD of collar which has a 1/8 keyway; threaded portion one end #5/16-24 tap; 1/32 x 45° cham both ends; NEMS-CLARKE part/dwg #A-12,610.	Mounted through lower helical gear O-14 to aid in linking dial assembly O-1 to air-dielectric capacitor C1

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-422/SRA-16
ANTENNA COUPLER CU-423/SRA-16
ANTENNA COUPLER CU-424/SRA-16
ANTENNA COUPLER CU-425/SRA-16

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-18	(b)	BUSHING, PLAIN, FLANGED: brass, nickel plated; shape style 2A section A11 Ref Dwg Group 191, dimensions, A-0.375 in. bore, B-15/32 in. diam, C-0.406 in. lg, D-11/16 in. flange diam, E-1/8 in. flange width; NEMS-CLARKE part/dwg #A-12,614.	Mounts on shaft O-17 to maintain distance between helical gear O-14 and bearing O-12
O-19	(b)	WASHER, FLAT: round; stainless steel; hole, round 0.312 in. diam; 0.500 in. OD, 1/32 in. thk; NEMS-CLARKE part/dwg #A-12,611.	Holds bushing O-18
O-20	(g)	COUPLING: assembly consists of a phenolic sleeve 1 in. lg, 15/32 in. OD; shoulder in center 1/4 in. wd, 3/4 in. OD; shaft hole 5/16 in.; NEMS-CLARKE part/dwg #A-12,668-1; and two collars; brass, nickel plated; one each end; 3/4 in. OD, 0.469 in. ID; NEMS-CLARKE part/dwg #A-12,667 per assembly dwg #AA-13,083-1.	Couples shaft O-17 to worm gear O-21
O-21		WORM, GEAR: straight type; stainless steel, type 416; triple thd; 20° pressure angle; 0.4375 in. pitch diam; RH thread; 12°6′ helix angle; 0.2945 in. axial lead; 0.4985 in. OD; worm 3/4 in. lg on shaft 6-11/32 in. lg; NEMS-CLARKE part/dwg #A-12,427.	Drives spur gear O-27 of air-dielectric capacitor C1
O-22	(b)	COLLAR, SHAFT: brass, nickel plated; 11/32 in. lg, 5/8 in. diam; shaft hole 0.312 in. diam; two mounting holes one #36 (0.1085) drill and tap #6-32 thd, and the other #47 (0.078) drill, 90° apart; NEMS-CLARKE part/dwg #A-12,613.	Positions worm gear O-21 within bracket O-23
O-23	(b)	BRACKET: bearing mount, aluminum alloy, alodine finish; 1 in. wd, 1-1/4 in. high, 2-1/4 in. lg; four 5/32 in. diam drill #22 mounting holes; two 1/8 in. diam centering holes; one Fafnir Corp. #F-5 bearing press fitted into 11/16 in. hole on each end; NEMS-CLARKE part/dwg #A-12,604.	Bearing mount to support shaft of worm gear O-21
O-24	(g)	STOP, GEAR: for tuning; CRS, cad plated; 0.500 in. OD, 0.312 in. ID, 0.437 in. lg; RH stopping cam; one setscrew hole drill #36 (0.1085 diam) and tap #6-32, and one taper-pin hole, drill #49 (0.073) 90° apart; NEMS-CLARKE part/dwg #A-12,619.	Mounts on worm gear O-21 to prevent overshooting
O-25	(g)	STOP, GEAR: for tuning; CRS, cad plated; 0.500 in. OD, 0.312 in. ID, 0.437 in. lg; LH stopping cam; one setscrew hole drill #36 (0.1085 diam) and tap #6-32, and one taper pin hole, drill #49 (0.073), 90° apart; NEMS-CLARKE part/dwg #A-12,618.	Mounts on worm gear O-21 to prevent overshooting
O-26	(g)	STOP, PLATE: for tuning; CRS, cad plated; circular portion has a 0.531 in. rad and the stop portion has a rad of 0.812 in. from the center of the shaft hole; 1/16 in. thk; three elongated 5/16 in. diam mounting holes on a 3/8 in. rad from the center of the shaft hole; 1/8 in. diam pin hole, for 1/8 in. diam dowel pin, on a 3/8 in. rad from the center of the shaft hole; shaft hole drilled and reamed to 1/4 in. diam; NEMS-CLARKE part/dwg #A-12,621.	Mounts on worm gear O-27 to prevent overshooting
O-27		GEAR, WORM: concave type; bronze; 42 thd; 20° pressure angle; 1.3125 in. pitch diam; RH thd; 0.189 in. rad of throat; 1.373 in. throat diam; 1.385 in. OD; 0.250 in. bore; two holes on hub 90° apart, one #6-32 tap and the other #49 (0.073) drilled and reamed for #5/0 taper pin; three holes on gear proper #6-32 tap equally spaced on 0.750 in. diam; NEMS-CLARKE part/dwg #B-12,429.	Activates drive shaft of air-dielectric capacitor C1
O-28	(g)	KNOB: setscrew type; 1 in. lg, 2-3/8 in. diam; black anodize finished body; without markings; NEMS-CLARKE part/dwg #A-12,642.	Used with indicator disk O-29
O-29	(g)	DISK, INDICATOR: brass, nickel plated; disk 1-3/4 in. diam, 1/32 in. thk; hub 3/8 in. diam 5/16 in. wd; over-all width 11/32 in. shaft hole 0.250 in.; taper pin hole in hub #44 (0.086) drill and ream for 5/0 taper pin; engraved 1/8 condensed characters filled with black enamel; marked, 9-12 MC, 12-18 MC, and 18-26 MC; NEMS-CLARKE part/dwg #A-12,571.	Indicator for frequency band switching; used with knob O-28
O-30	(g)	SPRING: copper-beryllium, black, nickel plate; flat type; 27/32 in. lg, 5/8 in. wd and .020 in. thk; two mounting holes on shoulder #30 (0.128) drill; NEMS-CLARKE part/dwg #A-12,564.	Used with stop pin O-38 for control of frequency band switching

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-422/SRA-16
ANTENNA COUPLER CU-423/SRA-16
ANTENNA COUPLER CU-424/SRA-16
ANTENNA COUPLER CU-425/SRA-16

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-31	(b)	SHAFT: stainless steel; 6-1/2 in. lg, 0.250 in. diam; 1/32 x 45° cham both ends; NEMS-CLARKE part/dwg #A-12,623-1.	Drive shaft for frequency band switching
O-32		GEAR, SPUR: brass; 16 teeth, 20° pressure angle; section A, MBCA Ref Dwg Group 170 plain type 2, A-0.5625 in. OD, B-0.500 in. pitch diam, C-3/16 in. D-1/2 in. E-3/8 in. G-5/16 in.; NEMS-CLARKE part/dwg #A-12,425.	Mounts on shaft O-31 to drive gear O-33
O-33		GEAR, SPUR: single material, brass; 80 teeth, 20° pressure angle; section A, MBCA Ref Dwg Group 170, plain type 2, A-2.5625 in. OD, B-2.500 in. pitch diam, C-3/16 in., D-1/2 in., E-5/8 in. diam, G-5/16 in.; NEMS-CLARKE part/dwg #A-12,426.	Drives indicator disk shaft O-34. Enmeshes with gear O-32
O-34	(b)	SHAFT: stainless steel; 1-7/8 in. lg, 1/4 in. diam; 1/32 x 45° cham both ends; NEMS-CLARKE part/dwg #A-12,665.	Drive shaft for indicator disk O-29
O-35	(b)	BUSHING, PLAIN, SLEEVE: shape style #1A section A, Ref Dwg Group 191, A-0.250 in. ID, B-1/2 in. OD, C-0.437 in. lg; brass, nickel plated; NEMS-CLARKE part/dwg #A-12,600.	Maintains distance between spur gear O-35 and mounting bracket O-36
O-36	(g)	BRACKET: N.R.L. alloy "C", nickel plate; "U" shaped with shoulder at one side of top for mounting stop pin O-38; 1-7/8 in. lg, 1-5/16 in. wd 1-7/8 in. high; four mounting holes, drill #36 (0.106) and tap #6-32 thru; two centering holes 1/8 in. diam for dowel pins mounted through the panel; two holes drill #22 (0.157) for mounting gear stop O-37; two holes 1/4 diam bored in line for indicator disk drive shaft O-34; one hole for mounting stop pin pivot guide O-39 5/16 in. diam and ctb 7/16 in. diam x 1/16 in. d; NEMS-CLARKE part/dwg #B-12,430.	Mounts stop pin O-38 gear stop O-37, indicator disk drive shaft O-38, and bearing O-39
O-37	(b)	STOP, GEAR: brass, silver plated; a block with a trapezoid face and a rectangular cross section; 7/8 in. lg, 1/4 in. wd, 5/16 in. high; end slope 30° toward each other; two mounting holes #6-32 tap; NEMS-CLARKE part/dwg #A-12,664.	Prevents indicator disk gear O-33 from overshooting
O-38	(g)	PIN, STRAIGHT, HEADLESS: stainless steel; type 304, MIL-S-853; 27/32 in. over-all length, 0.187 in. diam; one end 0.015 in. x 45° cham, other end rounded with a 0.093 in. rad; NEMS-CLARKE part/dwg #A-12,601.	Used with spring O-38 for control of frequency-band switching
O-39	(g)	BEARING, PLAIN, FLANGED: oilite bronze; shape style No. 2A, section A11, Ref Dwg Group 191; dimensional data section A, 2a, A-0.187 in. ID, B-0.3135 in. OD, C-0.500 in. lg, D-0.421 in. OD flange; E-0.062 in. thk flange; self-impregnated; NEMS-CLARKE part/dwg #A-12,599.	Holds pin O-38
O-40		BEARING, BALL: com. #F-4 Fafnir.	4 mounted in frequency-band switching gear box; 2 used on gear shaft of vacuum capacitors C4-1 and C4-2
O-41		WORM, GEAR: 4 thd, #HQUH (24P, 1/2P diam) Boston Gear Works.	Upper gear in frequency-band switching gear box
O-42	(b)	BUSHING, PLAIN, SLEEVE: brass, nickel plate; shape style 1A, section A, 1 Ref Dwg Group 191; dimensions, A-0.250 in. ID, B-0.375 in. OD, 0.194 in. lg; NEMS-CLARKE part/dwg #A-12,646.	Used for positioning worm gear O-41
O-43	(b)	SHAFT: stainless steel; 3-1/4 in. lg, 0.250 in. diam; 1/32 x 45° cham both ends; NEMS-CLARKE part/dwg #A-12,623-3.	Lower shaft in frequency-band switching gear box
O-44		GEAR, WORM: concave type; bronze; Boston Gear part #Q-1334 modified as follows: re-drill shaft hole to 0.251 in.; two holes on the side of the hub 90° apart, one #47 (0.078) drill to center line, the other #29 (0.136) drill and tap #8-32 per NEMS-CLARKE part/dwg #A-13,243.	One gear O-44 mounted on shaft O-43 to activate two gears O-45
O-45		GEAR, SPUR: Boston Gear part #Q-1334 modified by 2 holes #47 (0.078) 90° apart drilled to center line 1/8 in. from hub end per NEMS-CLARKE part/dwg #A-13,242.	Two gears O-45 mounted on shaft O-43 to activate two spur gear racks O-46

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-422/SRA-16
ANTENNA COUPLER CU-423/SRA-16
ANTENNA COUPLER CU-424/SRA-16
ANTENNA COUPLER CU-425/SRA-16

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-46		GEAR RACK: spur type; 32 dimetrical pitch; 1/8 in. square; 14-1/2° pressure angle; brass, nickel plate; 3-1/2 in. lg, 3/16 in. thk, 3/16 in. high two end holes drill #42 (0.094) diam and counter sink 0.172 in. diam x 82° drilled in end sections which are 5/16 in. lg; Boston Gear #G-583 as modified in NEMS-CLARKE part/dwg #A-12,737.	Activates two shorting bar plungers E2 for frequency-band switching
O-47	(g)	GUIDE, GEAR: brass, silver plate; 4-7/16 in. overall length, 1/2 in. diam; stud 7/16 in. lg #8-32 one end thd, other end 1/32 x 45° cham; through 3/32 in. d, 0.193 in. wd and 3-5/8 in. lg from cham end; two holes for mounting gear rack, drill #50 (0.070) diam x 3/16 in. d and tap #2-56 thd; NEMS-CLARKE part/dwg #A-12,735.	Mounting for spur gear racks O-46
O-48	(g)	KNOB: setscrew type; 23/32 in. lg over-all 1-1/4 in. max OD; anodized finished body; black; without markings; NEMS-CLARKE part/dwg #A-12,640.	Used with "COUPLING" dial O-49
O-49	(g)	DIAL, SCALE: 0 to 10 left to right; 2 in. diam, .032 in. thk; three mounting holes 3/32 in. diam spaced 120° apart on 7/32 in. rad; NEMS-CLARKE part/dwg #A-12,641.	Dial for "COUPLING" circuit
O-50	(b)	SHAFT: stainless steel; 13-1/16 in. lg, 0.250 in. diam; both ends cham 1/32 x 45°; Nat'l Elec. Mach. part/dwg #A-12,623-2.	Coupling shaft for miter gear O-51
O-51		GEAR, MITER: straight type; brass; 16 teeth; 1/8 in. face; 1/2 in. pitch diam; 3/16 in. bore; two #6-32 tapped setscrew hole; Chicago Gear Works part #M-103; modified per NEMS-CLARKE part/dwg #A-13,069-3.	Mounts on coupling shaft O-50 to drive miter gear O-52
O-52		GEAR, MITER: straight type; brass; 16 teeth; 1/8 in. face; 1/2 in. pitch diam; 1/4 in. bore two #6-32 tapped setscrew holes, Chicago Gear Works part #M-103; modified per NEMS-CLARKE part/dwg #A-13,069-1.	Drives counter M2, enmeshes with gear O-51
O-53	(g)	COUPLING: assembly consists of a phenolic sleeve 1 in. lg, 15/32 in. OD; shoulder in center 1/4 in. wd, 3/4 in. OD; shaft hole 1/4 in.; taper pin and setscrew holes in each end; NEMS-CLARKE part/dwg #A-12,668-3; and two collars, brass, nickel plated, one each end; 3/4 in. OD; 0.469 in. ID; #6-32 tapped, setscrew hole and 0.110 in. diam taper pin hole half drilled, at each end; NEMS-CLARKE part/dwg #A-12,667 per assembly dwg NEMS-CLARKE dwg #AA-13,083-3.	Couples shaft O-17 to worm gear O-21
O-54		WORM, GEAR: straight type; stainless steel, type 314 MIL-S-853; single thd; #3/8-16 thd; threaded portion 2-25/32 in. lg; both ends 0.250 in. diam; both ends cham 1/32 in. by 45°; NEMS-CLARKE part/dwg #A-12,624.	Mounted for stops O-56 and detent O-57
O-55	(b)	BUSHING, PLAIN, SLEEVE: to maintain distance between coupling assembly and support casting; brass, nickel plated; shape style 1A section A, 1. Ref Dwg Group 191; dimenions OD, C-5/16 in. lg; NEMS-CLARKE part/dwg #A-12,573.	
O-56	(b)	STOP, GEAR: brass, nickel plate; 7/8 in. OD, 1/4 in. thk; shaft hole drilled 5/16 in. diam, and tapped 3/8-16; two mounting holes drill #43 (0.089) and tapped #4-40; hole for 0.062 in. diam stop pin; NEMS-CLARKE part/dwg #A-12,626.	Mounted on worm gear O-54 to prevent overshooting of coupling gears O-59
O-57	(g)	DETENT: brass, silver plate; 1-3/32 in. high, 1/4 in. thk, 5/8 in. max width; slot 1/4 in. d for mounting on guide rod; worm shaft hole 5/16 in. diam and tap #3/8-16 through; dowel pin 1/16 in. by 3/8 in. mounted through detent; NEMS-CLARKE part/dwg #A-12,625.	Mounts on worm gear O-54 for controlling the range of vacuum capacitors C4-1 and C4-2
O-58		GEAR, SPUR: plain style No. 2 section A, MBCA Ref Dwg Group 170; gear compound phenolic; 36 teeth; 20° pressure angle; dimensional data, Section A, MBCA Ref Dwg Group 170, A-1.583 in. OD, B-1-1/2 in. pitch diam, C-1/4 in. width of face, D-11/16 in. over-all length, E-5/8 in. OD of hub end, G-7/16 in. distance from end of hub to gear face; NEMS-CLARKE part/dwg #A-12,424.	Single spur gear for driving double spur gears O-59

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-422/SRA-16
ANTENNA COUPLER CU-423/SRA-16
ANTENNA COUPLER CU-424/SRA-16
ANTENNA COUPLER CU-425/SRA-16

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-59		GEAR, SPUR: plain style No. 2 section A, MBCA Ref Dwg Group 170; gear compound phenolic; 72 teeth; 20° pressure angle; dimensional data, section A, MBCA Ref Dwg Group 170, A-3.0833 in. OD, B-3 in. pitch diam, C-1/4 in. width of face, D-11/16 in. over-all length, E-1 in. OD of hub end, G-7/16 in. from end of hub to gear face; NEMS-CLARKE part/dwg #A-12,423.	Double spur gears for driving vacuum capacitors C4-1 and C4-2
O-60	(b)	ROD, GUIDE: brass, nickel plate; 6 in. lg over-all 1/8 in. diam; threaded section 3/8 in. lg #5-40 thd; slotted head 1/4 in. diam 0.7/64 in. lg; NEMS-CLARKE part/dwg #A-12,628.	To guide detent O-57 along worm gear O-54
O-61	(g)	CLAMP, ELECTRICAL: assembly consists of two blocks held together by a machine screw; the screw is a #4-40, round head, brass, nickel plated, 1 in. lg; the blocks are: brass, silver plated, 1/2 in. lg, 3/8 in. wd and 9/32 in. thk; the blocks are notched to provide clamping action; one block has a hole #32 (0.116) diam drill, the other has a hole #43 (0.083) dial drill and tap #4-40 thd; NEMS-CLARKE part/dwg #A-12,578.	Clamps for vacuum capacitors C4-1 and C4-2
O-62	(g)	CLIP: retaining; phosphor bronze, nickel plate, strip 1/32 in. thk, 7/16 in. wd approx 2-3/8 in. lg; one mtg hole 3/16 in. diam; NEMS-CLARKE part/dwg #A-13,605.	Retaining clips for vacuum capacitors C4-1 and C4-2
O-63	(g)	CLIP: locking; phosphor bronze, silver plate; 1-23/32 in. lg, 3/8 in. wd, 0.050 in. thk; NEMS-CLARKE part/dwg #A-13,522.	Locking clip for clamping O-64
O-64	(g)	CLIP, ELECTRICAL: phosphor bronze, silver plate; Jennings Mfg. Co. #PM3A Mount, with one fil. hd. machine screw #10-22 x 5/8 in. lg silver soldered in the bottom; NEMS-CLARKE part/dwg #AA-13,035.	Retaining clips for vacuum capacitor C3
O-65	(g)	FASTENER, LATCH: consisting of an assembly stop, arm, bearing, stop, screw, spring posts and associated hardware; NEMS-CLARKE part/dwg #AB-13,276.	Safety-catch on drawer chassis
O-66	(g)	GUIDE, DRAWER: stainless steel; one end flanged; flanged flattened on two sides; 1-1/4 in. lg, 7/8 in. max OD flange, 3/4 in. wd on flat side of flange; external thd #5/8-24; center hole 0.313 in. diam with flange end cham 1/16 x 30°; NEMS-CLARKE part/dwg #A-12,584.	Guide pin for receiving drawer chassis
O-67	(b) (i)	MOUNTING: block for mounting banana plug holder; KEL-F material; 2-1/4 in. lg, 1-1/2 in. wd, 1/2 in. thk; center hole 1 in. diam; 4 mounting holes drill #15 (0.180) diam on a 15/16 in. rad from the center; NEMS-CLARKE part/dwg #A-12,725.	Mounts output bar assembly E6 for coupler No. 1 and coupler No. 2
O-68	(b) (i)	MOUNTING: block for mounting banana plug holder; KEL-F material; 2-1/4 in. lg, 1-1/2 in. wd, 1/2 in. thk; center hole drill 11/32 in. diam and ctb 1 in. diam x 1/2 in. d; 4 mounting holes drill #15 (0.180) diam and ctb 0.312 in. diam by 3/16 in. d; NEMS-CLARKE part/dwg #A-12,726.	
O-69	(d)	FRAME: aluminum alloy, black-anodize finish; 4 in. lg, 2-11/16 in. wd, 3/16 in. thk; 4 corner holes drill #22 (0.157) diam; NEMS-CLARKE part/dwg #A-12,615.	Holder for calibration chart
O-70	(b)	WINDOW: lucite, clear; 3-7/8 in. lg, 2-9/16 in. wd, 1/32 in. thk; purchases from Colonial Kalomite Co.; NEMS-CLARKE part/dwg #A-12,616.	Cover for calibration chart
O-71	(b)	HOLDER, WRENCH: No. 3; full size, bronze; connector wire; Fahnestock Electric Co. nomenclature.	Mounts #4, #6, #8 and #1/4 Allen wrenches
O-72	(b)	MOUNTING: block; silicone glass laminate; 3-5/8 in. lg, 7/8 in. wd, 3/8 in. thk; two mounting holes, drill through 7/32 in. (0.218) diam and ctb 3/8 in. diam by 1/4 in. dp; two centering holes 3/16 in. (0.187) diam; NEMS-CLARKE part/dwg #A-13,508.	Block for supporting vacuum capacitor C3

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ANTENNA COUPLER CU-422/SRA-16
ANTENNA COUPLER CU-423/SRA-16
ANTENNA COUPLER CU-424/SRA-16
ANTENNA COUPLER CU-425/SRA-16

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O-73	(b)	MOUNTING: silicon fibre glass laminate; 6-3/8 in. lg, 5/8 in. wd, 3/8 in. thk; two mounting holes 1/2 in. from end, 9/32 (0.281) dia. two holes 1-1/2 in. from center line drill #7 (0.201); NEMS-CLARKE part/dwg #A-12,666.	Mounting for capacitors C4-1 and C4-2
O-74	(b)	MOUNTING: silicone fibre glass laminate; 6-3/8 in. lg, 1-1/16 in. wd, 3/8 in. thk; two end mounting holes 9/32 (0.281) dia. drill; two holes for mounting capacitor clips 7/32 (0.218) dia drill; NEMS-CLARKE part/dwg #A-13,517.	Mounting for capacitors C4-1 and C4-2
P1		CONNECTOR, PLUG, ELECTRICAL: 90° angle; UG-27A/U per JAN-C-71.	90° plug connecting directional coupler DC1 to plug P2
P2	(f)	CONNECTOR, PLUG: UG-21B/U, per Navy dwg RE49F402.	Used on cable W1 to connect input receptacle J1 to plug P1
P3		CONNECTOR, PLUG: UG-21B/U, per Navy dwg RE49F402. Same as P2.	Used on cable W2 to connect directional coupler DC1 to air-dielectric capacitor C1
P4	(f)	CONNECTOR, PLUG: giant banana plug #398 P. Birnback Radio Company	Connects coupler to receptacle J301
R1		RESISTOR, FIXED, COMPOSITION: body style No. 14, Ref Dwg Group 2; 6200 ohms total resistance; ±5% tolerance; 1/2 w; Allen-Bradley.	Used with sensitivity switch S1
R2		RESISTOR, FIXED, COMPOSITION: 120 ohms total resistance; ±5% tolerance; 1/2 w; Allen-Bradley.	Part of directional coupler DC1
S1		SWITCH, TOGGLE: SPST; 2 positions; Arrow, Hart and Hegeman; ST12A per JAN-S-23 spec.	Sensitivity switch for meter M1
TB1	(b)	TERMINAL BOARD: silicone fibre glass laminate; accommodates 20 terminals; 5 in. lg, 1-1/2 in. wd, 3/8 in. thk, per NEMS-CLARKE part/dwg #A-12,565.	Mounts electrical contact assembly E1
W1	(j)	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL: approx 13 in. lg; assembly consists of a coaxial cable RG-8/U, a coaxial fitting UG-21B/U, and a coaxial fitting UG-22B/U; per NEMS-CLARKE part/dwg #A-12,727.	Connects input receptacle J1 to directional coupler DC1
W2	(j)	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL: 15-1/8 in. lg; assembly consists of a coaxial cable, RG-8/U, one coaxial fitting, UG-21B/U, one solder lug, 45° angle, Sherman #4, and a copper strap, silver plated, 3 in. lg, 5/16 in. wd, 1/32 in. thk, per NEMS-CLARKE part/dwg #AA-12,728.	Connects directional coupler DC1 to air-dielectric capacitor C1
W3	(j)	CABLE ASSEMBLY, RADIO-FREQUENCY: assembly consists of two solder lugs, Sherman, A-1/4; and one copper tube 3/16 in. OD, 1/32 in. wall, 3-1/2 in. lg, NEMS-CLARKE part/dwg A-12,724-1 per assembly NEMS-CLARKE part/dwg #AA-12,723-1.	Used on air-dielectric capacitor C1
W4	(j)	CABLE ASSEMBLY, RADIO-FREQUENCY: assembly consists of two solder lugs, Sherman, A-1/4; and one copper tube 3/16 in. OD, 1/32 in. wall, 2-3/8 in. lg, NEMS-CLARKE part/dwg A-12,724-2 per assembly NEMS-CLARKE part/dwg #AA-12,723-2.	Used on air-dielectric capacitor C1

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

FUSE PANEL SB-407/SRA-16

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
	(d)	PANEL, FUSE SB-407/SRA-16: Contains four fuses, indicator lamp, connector and receptacle; 11-7/32 in. h x 24-3/4 in. wd x 10-3/8 in. d; cabinet mounted on pull-out slides; NEMS-CLARKE, part/dwg #AC-13,053-5.	Mounts components for protecting blower assembly
E201		CLAMP, ELECTRICAL: cable clamp; AN3057-6 Amphenol.	Clamps power cable on P201
F201		FUSE, CARTRIDGE: Navy type 28032-3; 3 amp; blowing time, life at 110%, 1 hr at 135%, 5-6 sec at 200% load; 250V; one time; glass body; ferrule term; 1-1/4 in. lg x 1/4 in. diam at each end; Littelfuse (LTF) type 3AG, part #1043.	A-C line
F202		Same as F201.	A-C line
XF201		FUSE HOLDER: in-the-line type; 250V, 3 amp; two holders are for one line fuse each; two holders are for one spare fuse each; coml. H.K.P. Bussman Mfg. Co.	Holder for line and spare fuses
I-201		LAMP, INCANDESCENT: double contact, bayonet type; replaceable from the front of the cabinet; 120V, 6w; 6S6 DC General Electric.	Signal lamp to indicate blower unit is operating
J201		CONNECTOR, RECEPTACLE: AN3102A-14S-7P Amphenol.	Power input
P201		CONNECTOR, PLUG: 90° angle plug; AN-3108B-14S-7S Amphenol.	Power input plug
XI-201	(g)	LAMPHOLDER: part of assembly LH63BG2 per MIL-L-3661, per Dial Light Corp. #51202-112; the lampholder carries the catalog #51202-1 Dial Light Corp.	Holder for lamp I-201 and and lens XI-202
XI-202		LENS, INDICATOR LIGHT: includes lensholder; catalog #51-112 Dial Light Corp.	Lens for lamp I-201

TABLE 8-1. MAINTENANCE PARTS LIST—Continued

ELECTRICAL EQUIPMENT CABINET CY-1671/SRA-16

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
	(d)	CABINET, ELECTRICAL EQUIPMENT CY-1671/SRA-16: Contains four antenna couplers, a fuse panel, blower assembly, vertical coaxial tube, and air ducts; 46-3/4 in. h x 26-1/4 in. wd x 20-1/2 in. d; NEMS-CLARKE part/dwg #AC-13,053-6.	Contains major units and assemblies of Coupler Group, Antenna AN/SRA-16
B301		MOTOR, ALTERNATING CURRENT: dual voltage; 115/230V ac; model DRCP, type KS-505-CCW, series 153 BS Rotron Mfg. Co.	Motor for blower unit
C301		CAPACITOR, FIXED, PAPER DIELECTRIC: 3 μf; 220V R.B.F. #701 Aerovox.	Motor starting capacitor
E301	(g)	TERMINAL, STUD: brass, silver plate; 1-11/16 in. lg, 7/8 in. wd, 5/16 in. thk; feed through threaded type; NEMS-CLARKE part/dwg #A-12,629.	Output plug assembly terminal connection
E302	(b)	INSULATOR, STANDOFF: silicon fibre glass laminate; 1-5/8 in. sq, 1/4 in. thk; NEMS-CLARKE part/dwg #A-12,635.	Mounting for E301
FL301		FILTER, AIR CONDITIONING: fiberglas; 10 in. by 10 in. by 1 in.; Owens Corning Corp.	Filter for blower unit (2 per set)
J301		CONNECTOR, RECEPTACLE: giant jack; #399 Birnbach Radio Co.	Receptacle for banana plug J1 (8 per set)
J302		CONNECTOR, RECEPTACLE: UG-352A/U; per Navy dwg RE49F509.	Output jack (to antenna)
O-301	(d)	Not Applicable.	Lifting ring (4 per set)
O-302	(b)	MOUNTING: block for mounting guide pin; stainless steel; 1/2 in. diam, 5/16 in. thk; center hole drill "F" (.257) diam and tap #5/16—18 thd; three mounting holes 120° apart on 19/32 in. radius, drill #36 (.106) diam and tap #6/32 thd; notched parallel to the flat surface 1/8 in. dp, 13/32 in. along center line on one edge; NEMS-CLARKE part/dwg #A-12,581-1.	Mounts contact blocks E301 (4 per set)
O-303	(b)	MOUNTING: block; stainless steel; 1/2 in. diam, 5/16 in. thk; center hole drill "F" (0.257) diam and tap #5/16-18 thd; three mounting holes 120° apart on 19/32 in. rad drill #36 (0.106) diam and tap #6-32 thd; NEMS-CLARKE part/dwg #A-12,581-2.	Mounts guide pin O-304 (4 per set)
O-304	(b)	PIN, STRAIGHT, HEADED: stainless steel, passivate finish; 1-15/16 in. over-all length; shank and 1-1/2 in. lg, 0.312 in. diam, end pointed 1/32 in. rad 30°; square collar 5/16 in. from other end 1/8 in. thk, 3/4 in. on a side, corners rounded on a 7/16 in. rad; end section 5/16 in. lg, threaded 5/16-18; NEMS-CLARKE part/dwg #A-13,516.	Aligns drawer chassis in cabinet (4 per set)
O-305	(g)	DUCT ASSEMBLY, AIR: assembly consists of: an aluminum base; 2-1/8 in. OD two sides shirred to a width of 1-1/2 in.; base 3/8 in. thk; two mounting holes 3/16 in. diam center hole for tube 1-1/8 in. (1.125) diam drill through & ctb 1-11/64 in. NEMS-CLARKE part/dwg #A-13,520; and a tube; PBG natural phenolic fungicidal vac. varnish impregnated; 7-5/8 in. lg, 1-1/4 in. OD, 1 in. ID; base end under cut externally to 1.124 in., 3/8 in. d; other end cut back on a 45° angle; NEMS-CLARKE part/dwg #A-13,519; per assembly dwg #AB-13,521.	Ventilating duct assembly
TB301	(f)	STRIP, TERMINAL: general-purpose terminal strip; 4 double screw type terminals; bakelite; 3-1/4 in. lg x 1-9/32 in. wd x 5/8 in. thk; Howard B. Jones Division of Cinch Man. Corp. part #4-142.	Connections for input power

TABLE 8-1A. SUPPLEMENTAL MAINTENANCE PARTS LIST

ANTENNA COUPLER GROUP AN/SRA-16A

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
B301		BLOWER, MOTOR: Rotron Mfg. Co., model DRPP type KS505-CCW, series 328BS; CBOR no. 5051-01	Circulation of air
C1		CAPACITOR, VARIABLE, AIR DIELECTRIC: Plate meshing type; three sections, capacity approx 10 mmf min, 50 mmf max; straight-line wave length tuning characteristics, 1000 V a-c peak voltage, no trimmers, shaft adjustment 180° cw rotation of the plates; approx 9-3/4 in. lg o/a, 3-7/8 in. wd, 6-7/8 in. high; CBOR dwg no. 6-1A-1	Variable input coupling capacitor
C2		CAPACITOR, FIXED: MICA; 0.01 mf, ±5%; MIL type CM 35C103J, per spec MIL-C-5A; CBOR part no. 1102-01-1	Microammeter by pass
C3		CAPACITOR, VARIABLE: Vacuum type; 10-300 mmf, 7.5 kv; 3-1/8 in. dia, 8 in. lg, o/a; Jennings Radio Mfg. Co. Type UCS: CBOR part no. 1101-04-1	Impedance tuning
C4		CAPACITOR, VARIABLE: Vacuum type; 5-25 mmf, 20 kv; 2-1/8 in. dia, 6-5/8 in. lg, o/a; Jennings Radio Mfg. Co. Type TC; CBOR part no. 1101-02-1	Input coupling and compensating capacitor
C301		CAPACITOR, FIXED: paper composition; 2.5 mf, 230 VAC 1-3/8 in. lg, P.R.Mallary Co., Inc. part no. 20C23025; CBOR part no. 1103-03-1	Motor starting capacitor
CR1		RECTIFIER: crystal; JAN type 1N69A, per spec MIL-E-1D; CBOR part no. 1301-01	Meter rectifier
E3		INSULATOR, STANDOFF: Isolantite Mfg Corp., part no. 323L-1-1/2; CBOR dwg no. 7456-07	Insulated mount for E2
E7		INSULATOR, SUPPORT: Isolantite Mfg. Corp., part no. 397L-3/4; CBOR dwg no. 7456-05	Insulator in DC-1
E8		INSULATOR: KEL-F; 2-1/4 in. OD, 1-11/64 thk, 7/8 in. dia. hole 7/8 in. deep, 11/32 in. hole thru center, four .182 dia mounting holes; CBOR dwg no. 6-3-2	Insulator
E201		CLAMP, CABLE: type AN 3057-6	Mates with J201
H1		THUMBSCREW: Cambridge Thermionic Corp., part no. 1120-A; CBOR dwg no. 7053-01	Mounts calibration chart frame on panel
H3		GASKET: Vellumoid fiber; 6 in. OD; 5-1/4 in. ID; 1/16 in. thk; CBOR dwg no. 7702-01	Prevents air leak between blower and filter
H4		COLLAR: sponge rubber "rubatex" R203H, 8-1/2 in. lg, 13/16 in. wd, 1/8 in. thk; CBOR no. 7703-01-1	Couples blower output duck in cabinet
H5		MOUNT, VIBRATION: Barry Controls Co., part no. C2090T-b; modified per CBOR part no. 7351-01-1	Isolates equipment
H6		MOUNTING: KEL-F; 2-1/4 in. lg, 1-1/2 in. wd, 3/4 in. thk; four .180 in. dia mounting holes; CBOR dwg no. 6-1-33	Insulator
I201		LAMP, INCANDESCENT: general Electric type no. 6S6DC; CBOR dwg no. 2051-03	Power indicator lamp
J1		CONNECTOR, RECEPTACLE: MIL-type UG-22B/U; CBOR part no. 1202-05	Input Jack
J2 J3		CONNECTOR, RECEPTACLE: MIL-type UG-58A/U, per spec MIL-C-71A; CBOR part no. 1202-02	Interconnections
J201		CONNECTOR, RECEPTACLE: AN type AN3102A-14S-7P; CBOR part no. 1201-02	Power input
J301		CONNECTOR, RECEPTACLE: Jack; Birnbach Radio Co., type no. 399; CBOR no. 2651-01-1	Receptacle of P1 and P4
J302		CONNECTOR, RECEPTACLE: MIL type UG-352A/U modified per CBOR dwg no. 1203-01-1	Output connection
FL301		FILTER, AIR: fiberglass 10 in. lg, 10 in. wide, 1 in. thk o/a; Owens Corning Corp; CBOR part no. 1951-01	Filter for blower unit

TABLE 8-1A. SUPPLEMENTAL MAINTENANCE PARTS LIST

ANTENNA COUPLER GROUP AN/SRA-16A

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
L1		COIL ASSY: single layer wound; 11 turns; nilvar rod .187 in. dia; silver plate finish; 2-3/4 in. ID of coil loops, 3-1/8 in. OD, 7 in. lg; three contact assemblies silver soldered coil; CBOR dwg no. 6-1J-1	Tank inductance coil
M1		METER ELECTRICAL: D.C. microampere type; Weston Electric Instrument Co. Model No. 301; MIL type MR35-W050-DCUA, marked DC; per spec MIL-M-6A; CBOR part no. 1801-01-1	Tuning indicator
M2		COUNTER, DIRECT DRIVE: Veeder Root, Inc., series E114134, modified per CBOR dwg no. 5401-02-1	Indicates setting of coupling control
M3		COUNTER, DIRECT DRIVE: Veeder Root, Inc. series E114114, modified per CBOR dwg no. 5401-03-1	Indicates setting of tuning control
MP1		SPRING, TENSION: Steel music wire #18, 4 turns LH on 43/64 ID; CBOR part no. 6401-01-1	Part of fastener latch assembly
MP2		SPRING TENSION: Steel music wire #18, 4 turns RH on 43/64 ID; CBOR dwg no 6401-01-2	Part of fastener latch assembly
MP3		SPRING, Steel music wire #20, 6 coils 1/4 in. OD, 1/2 in. lg; CBOR dwg no. 6401-02	Part of knob assembly
MP4		BANDSWITCH, ASSY: This unit consists of the following items: L1, E1, E2, O46, O43, O42, O44, O47, TH1, O41, O31 and associated casting. CBOR dwg no. 6-1E-1	Bandswitch assembly
O1		DIAL ASSEMBLY: scale 0 to 10 left to right in increments of 10; 3-1/4 in. dia, 1/32 in. thk; three knob mounting holes .140 in. dia, 120° apart on 15/32 in. rad; black finish; white markings; CBOR dwg no. 6751-01-1; knob 2-1/4 in. dia, 1-1/16 in. lg; 3/16 in. holes black finish; CBOR dwg no. 6802-01-3. Assembly dwg CBOR 6750-01-3	Dial assembly for tuning circuit
O3		BEARING, SLEEVE: Brass, nickel plated; 1/2 in. OD, 1/4 in. ID, 3/8 in. lg o/a with 9/16 in. hex flange one end,, #1/2-20 thd 1/4 in. lg at other end; CBOR No. 5151-01-1	Bearings for dial knob-shafts
O4		GEAR, MITER: Chicago Gear Works, part no. M103 modified per CBOR dwg no. 5801-02-4	Mount on dial drive shaft
O5		GEAR, MITER: Chicago Gear Works, part no. M103 modified per CBOR dwg no. 5801-02-2	Drives counter
O6		GEAR, MITER: Boston Gear Works, part no. G461Y, modified per CBOR dwg no. 5801-01-1	Matched gears to drive counters
O9		SHAFT: Dial drive shaft; stainless steel; 4-5/8 in. lg o/a; 13/16 in. OD; 1/4 in. dia on dial end, 1-13/16 in. lg, 1/2 in. dia other end; 1/8 in. keyway; CBOR dwg no. 6-1-18	Dial drive shaft for tuning circuit
O10		BUSHING, PLAIN, FLANGED: Aluminum, 1-3/8 in. OD, 25/32 in. ID, 1/4 in. thk. CBOR dwg no. 7851-01	Bushing for O23
O12		BEARING, BALL: Type 115 grade #00 per spec FF-B-171a; New Departure type 77-4-6; CBOR dwg no.6201-01	Part of tuning circuit
O14		GEAR, HELICAL: Single-helical tooth type; steel, cad plate; 45 teeth; 1/4 in. face; 20° pressure angle; 1.9887 in. pitch dia; 45° helix angle; LH thd; 2.0513 in. OD, 5/8 in. bore dia; keyway 1/8 in. x 1/16 in. CBOR dwg no. 6-1-7	Operates C3
O15		COUPLING, SHAFT RIGID: Flange type; assy consists of two 3 fingered flanges 120° apart; straight bored 1/2 in. dia shaft hole; #4-40 tapped hole in each finger on 1-5/8 in. dia; two #6-32 tapped setscrew holes 90° apart; one coupling disk, phenolic, 2 in. dia, 1/8 in. thk; 6 holes .128 in. dia, 60° apart on 1-5/8 in. dia; CBOR dwg no. 6-1T-1	Couples O9 to C3
O17		SHAFT: Stainless steel; 2-13/32 in. lg; 0.625 in. OD of collar which has a 1/8 in. keyway; threaded portion one end #5/16 24 thrd; 1/32 in. x 45° cham both ends; CBOR dwg no. 6-1-19	Links dial assembly to C1

TABLE 8-1A. SUPPLEMENTAL MAINTENANCE PARTS LIST

ANTENNA COUPLER GROUP AN/SRA-16A

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O20		SLEEVE, COUPLING: Phenolic, 15/32 in. OD, 1/4 in. wide 3/4 in. OD shoulder in center, 5/16 in. ID, 1 in. lg o/a. CBOR no. 5152-01-1	Part of coupling assembly
O21		WORM, GEAR: Straight type; stainless steel, triple thd; 20° pressure angle; 0.4375 in. pitch dia; RH thd; 12° 6' helix angle; 0.2945 in. axial lead; 0.4985 in. OD; worm 3/4 in. lg on shaft 6-11/32 in. lg; CBOR dwg no. 6-1A-10	Drives O27
O27		GEAR, WORM: Bronze; concave type; 42 thd; 20° pressure angle; 1.3125 in. pitch dia; RH thd; 0.189 in. rad of throat; 1.373 in. throat dia; 1.385 in. OD; 0.250 in. bore; two holes on hub 90° apart; one #6-32 tap and the other #5/64 drill; three holes on rear proper #6-32 tap equally spaced on 0.750 in. dia; CBOR dwg no. 6-1A-6	Activates C1
O29		DIAL, INDICATOR: Brass, nickel plated; disk 1-3/4 in. dia, 1/32 in. thk, hub 3/8 in. dia, 5/16 in. wd; o/a width 11/32 i in. shaft hole .250 in., groove pin hole in hub #5/64 drill; engraved 1/8 condensed characters filled with black enamel, marked, 9-12MC, 12-18 MC, 18-26 MC; CBOR dwg no. 6-1S-1	Frequency Indicator
O32		GEAR, SPUR: Brass; 16 teeth; 20° pressure angle; 0.5625 in. OD; 0.500 in. pitch dia, 3/16 in. width of face, 1/2 in. lg o/a, 3/8 in. hub dia, 5/16 in. lg hub; CBOR dwg no. 6-1E-3	Mounts O31 and drives O33
O33		GEAR, SPUR: Brass; 80 teeth; 20° pressure angle; 2/5625 in. OD, 2,500 in. pitch dia, 3/16 in. width of face, 1/2 in. lg o/a; 5/8 in. OD of hub, 5/16 in. distance from end of hub to gear face; CBOR dwg no. 6-1-6	Drives indicator disk shaft
O36		BRACKET: Manganese bronze; U shaped with shoulder at one side of top for mounting pin O38, 1-7/8 in. lg, 1-5/16 in. wide,, 1-7/8 in. high; four 6-32 tapped mounting holes; CBOR dwg no. 6-1-14	To support gears and shaft for band switch
O40		BEARING, BALL: Fafnir Bearing Co., type F-4-DD per spec FF-B-171a; CBOR no. 6201-10	Mounting for vacuum capacitor shaft
O41		GEAR, WORM: Boston Gear Works part no. HQUH, modified per CBOR dwg no. 5802-06	Upper gear in frequency band switching gear box
O44		GEAR, WORM: Boston Gear Works part no. Q-1334, modified per CBOR dwg no. 5802-05-1	Activates O45
O45		GEAR, SPUR: Boston Gear Works part no. H3220, modofied per CBOR dwg no. 5808-02-1	Activates O46
O46		GEAR, RACK: Boston Gear Works part no. G-583, modified per CBOR dwg no. 5803-01-1	Activates E2
O51		GEAR, MITER: Chicago Gear Works, part no. M103, modified per CBOR dwg no. 5801-02-3	Mounts on coupling shaft
O52		GEAR, MITER: Chicago Gear Works, part no. M103, modified per CBOR dwg no. 5801-02-1	Drives M2
O53		SLEEVE, COUPLING: Phenolic, 15-32 in. OD, 1/4 in. wide, 3/4 in. OD shoulder in center, 1/4 in. ID; 1 in. lg over all. CBOR dwg no. 5152-01-3	P/o coupling assembly
O58		GEAR, SPUR: Phenolic; 36 teeth; 20° pressure angle; 1.583 in. OD, 1-1/2 in. pitch dia, 1/4 in. width of face, 11/16 in. lg over all, 5/8 in. ID of hub end, 7/16 in. distance from end of hub to gear face; CBOR dwg no. 6-1-5	Single spur gear for O59
O59		GEAR, SPUR: Phenolic; 72 teeth; 20° pressure angle; 3.0833 in. OD, 3 in. pitch dia; 1/4 in. width of face, 11/16 in. over all length, 1 in. OD of hub end, 7/16 in. from end of hub to gear face; CBOR dwg no. 6-1-4	Double spur gears for C4
O64		CLIP, HOLDER: Jennings Radio Mfg. part #QM2A; CBOR	Electrical contract for Vacuum capacitor

TABLE 8-1A. SUPPLEMENTAL MAINTENANCE PARTS LIST

ANTENNA COUPLER GROUP AN/SRA-16A

REFERENCE DESIGNATION	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
O70		WINDOW: Acrylic plastic per spec MIL-P-80B; 3-7/8 in. lg, 2-9/16 in. wide, 1/16 in. thk. CBOR dwg no. 7001-01	Cover for calibration chart
O75		BEARING BALL: Fafnir Bearing Co., type F-5-DD per spec FF-B-171a; CBOR no. 6201-09	Bearing mount for O21
O76		SHAFT, EXTENSION: stainless steel; 31/32 in. lg, 1/4 in. dia, 1/8 in. dia hole, 3/8 in. deep one end, 3/16 in. OD x 9/16 in. lg other end; CBOR dwg no. 6-1-43	Extension for counter shaft
O77		SHAFT, SUPPORT: Aluminum, 5-9/16 in. lg, 6-1/2 in. wide 4.359 in. high; four 0.250 in. dia mounting hole; CBOR dwg no. 6-1-2	Vacuum capacitor support
O301		EYEBOLT: J. H. Williams Co., part #22, 5/16-18; CBOR dwg no. 7052-01	Used as lifting eyebolts
P1		CONNECTOR, PLUG: MIL type UG-27A/U; CBOR part no. 1202-03	Interconnections
P3		CONNECTOR, PLUG: MIL type UG-21B/U; CBOR part no. 1202-01	Interconnections
P4		CONNECTOR, PLUG: General Radio Co., type G674-P; modified per CBOR dwg no. 2652-03-1	Connects coupler to J301
P201		CONNECTOR, PLUG: ANtype AN3108B-14S-7S; CBOR part no. 1201-01	Power input plug
P302		CONNECTOR, PLUG: MIL type UG-154/U; CBOR part no. 1203-02	Mates with output connector
R1		RESISTOR, FIXED: composition; 47,000 ohms ±5%, 1/2 w; MIL-type RC20GF473J per spec MIL-R-11C; CBOR part no. 1401-02	Limiting Resistor
R2		RESISTOR, FIXED: composition; 120 ohms ±5%, 1w; MIL-type RC32GF121J per spec MIL-R-11C; CBOR part no. 1402-01	Part of directional coupler
S1		SWITCH, TOGGLE: SPST: JAN type ST12A, per spec JAN-S-23; CBOR part no. 1451-01	Sensitivity switch for meter
TB301		TERMINAL STRIP: Type 8TB6 per spec MIL-T-16784A; CBOR part no. 1852-01	Connections for input power
W1		CABLE ASSEMBLY, SPECIAL PURPOSE: ELECTRICAL: approx. 13 in. lg. overall, assembly consists of coaxial cable RG-8/U, connector UG-21B/U; and connector UG-22B/U; CBOR dwg no. 6-12-1	Connects J1 to DC1
W2		CABLE, ASSEMBLY, SPECIAL PURPOSE: ELECTRICAL: 15-1/8 in. lg overall; consists of coaxial cable RG-8/U, one connector UG-21B/U, one soldered lug, 45° angle, burandy #YAV9C-I36, and a copper strap, silver plated, 3 in. lg. 5/16 in. wide, 1/32 in. thick; CBOR dwg no. 6-1AA-1	Connects DC1 to C1
XF201		FUSEHOLDER Bussman Mfr. Co., type HKP; CBOR part no. 2751-01	Holder for line and spare fuses
XI201		LAMPHOLDER: type LH63BG2, per spec MIL-L-3661 (MS-90286); CBOR part no. 2201-01	Holder for power lamp

TABLE 8-2. LIST OF MANUFACTURERS

ABBREVIATION	PREFIX	NAME	ADDRESS
Aerovox	CAW	Aerovox Corp.	742 Belleville Ave. New Bedford, Mass.
AB	CBC	Allen-Bradley Co.	118 W. Greenfield Ave. Milwaukee, Wis.
Amphenol	CPH	American Phenolic Corp.	1830 South Fifty-Fourth Ave. Chicago, Ill.
	CHH	Arrow, Hart and Hegeman Electric Co.	102 Hawthorne St. Hartford, Conn.
Birnback	CYB	Birnback Radio Co., Inc.	145 Hudson St. New York, N. Y.
	CBH	Boston Gear Works	10 Hayward St. W. Quincy, Mass.
Buss	CFA	Bussman Mfg. Co.	2538 W. University St. St. Louis, Mo.
		Cardwell Mfg. Co., Inc.	Wichita, Kans.
		Chicago Gear Works	Chicago, Ill.
		Colonial Kalomite Co.	
	CD	Cornell-Dubilier Corp.	1000 Hamilton Blvd. South Plainfield, N. J.
	CBI	Corning Glass Works (Owens-Corning Fiberglass Corp.)	1943 Crystal St. Corning, N. Y.
Dialia	CAYC	Dial Light Corp.	900 Broadway New York, N. Y.
Fafnir		Fafnir Bearing Co., The	New Britain, Conn.
		Fahnestock Electric Co., Inc.	Long Island, N. Y.
		Fish Brothers Refining Co.	Newark, N. J.
GE	CG	General Electric Co.	1 River Road Schenectady 5, N. Y.
GER	CAG	General Radio Co.	30 State Street Cambridge, Mass.
	CGM	General Motors Co. New Departure Div.	Detroit, Mich.
	CBU	Isolantite, Inc.	343 Countland St. Belleville, N. J.
	CAEG	Jennings Radio Mfg. Co.	1098 E. Williams St. San Jose 2, Calif.
	CN	Nems-Clarke, Inc.	
		Parker-Kalon Corp.	New York 14, N. Y.
		Rotron Mfg. Co.	Schoenmaker Lane Woodstock, N. Y.
	CAN	Sangamo Electric Co.	1935 Funk St. Springfield, Ill.
	CHS	Sylvania Electric Products, Inc.	Emporium, Pa.
	CASV	Veeder-Root, Inc.	25 Sargent St. Hartford, Conn.
W.E. Co.	CV	Weston Electric Instrument Co.	619 Frelinghuysen Ave. Newark, N. J.
		Williams Co., The	London, Ohio

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